# Warriors from the Sky: US Army Airborne Operational Art in Normandy

A Monograph

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# Abstract

Warriors from the Sky: US Army Airborne Operational Art in Normandy, by MAJ Dan Huff, 62 pages.

The success of airborne operations for German forces in 1939 and 1940 led the United States to look at the advantages of specialized forces to conduct forcible entry through the use of vertical envelopment. This monograph examines the role of airborne operations and the application of operational art using the Normandy campaign as a historical case study in order to answer the primary question: How did US Army airborne forces implement operational art as part of the Normandy invasion? The case study demonstrates multiple instances where manning, training, and equipping of the US airborne forces assisted in providing a specific set of capabilities required for conducting a cross-Channel joint forcible entry operation. This included the identification of specific missions for the airborne forces. As a result, the airborne forces employed in the Normandy campaign were able to provide an essential disruption effect and seize key terrain to prevent German reserve forces from contesting the beachhead landings.

It is important to examine the processes used to shape campaigns and identify operational objectives for forces to achieve results with respect to time, space, and purpose. Although the concept of operational art is a modern construct, there are many similarities which can be drawn from the implementation of airborne operations in June of 1944.

# Contents

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# Acronyms

| | |
|---|---|
| AHL | Airhead Line |
| ADP | Army Doctrine Publication |
| ADRP | Army Doctrine Reference Publication |
| AO | Area of Operations |
| APOD | Air Port of Debarkation |
| AT | Anti-tank |
| ATP | Army Techniques Procedures |
| CCDR | Combatant Commander |
| CARL | Combined Arms Research Library |
| COSSAC | Chief Of Staff to the Supreme Allied Commander |
| DZ | Drop Zone |
| FLOT | Forward Line of Own Troops |
| FM | Field Manual |
| FPOL | Forward Passage of Lines |
| GEOINT | Geological Intelligence |
| GIR | Glider Infantry Regiment |
| GRF | Global Response Force |
| HUMINT | Human Intelligence |
| IPB | Intelligence Preparation of the Battlefield |
| JFE | Joint Forcible Entry |
| JP | Joint Publication |
| JTF-PO | Joint Task Force – Port Opening |
| LGOP | Little Groups of Paratroopers |
| LZ | Landing Zone |
| OKH | Oberkommando des Heeres |

| | |
|---|---|
| OKW | Oberkommando der Wehrmacht |
| PIR | Parachute Infantry Regiment |
| PO | Port Opening |
| POAL | Priority of Air Lands |
| SHAEF | Supreme Headquarters Allied Expeditionary Force |
| SIGINT | Signal Intelligence |
| SPOD | Sea Port of Debarkation |
| TACON | Tactical Control |
| TECHINT | Technical Intelligence |
| TO | Task Organization |
| TFPDL | Time-Force Phase Deployment List |
| TRANSCOM | Transportation Command |
| TPFDD | Time-Force Phase Deployment Data |

# Illustrations

# Introduction

Airborne Operations are planned and staged with one eye on deception and one on the assault.

----Major General James M. Gavin, *Airborne Warfare*

The success of airborne operations for German forces in 1939 and 1940 led the United States to look at the advantages of specialized forces to conduct forcible entry through the use of vertical envelopment.[1] This monograph will examine the role of airborne operations and the application of operational art using the Normandy campaign as a historical case study.[2] It is important to examine the processes used to shape campaigns and identify operational objectives for forces to achieve results with respect to time, space, and purpose. Although the concept of operational art is a modern construct, there are many similarities which can be drawn from the implementation of airborne operations in June of 1944.

The Normandy operation illustrated the importance of identifying risk, controlling the tempo, choosing correct assault objectives, synchronizing and massing effects, and creating multiple dilemmas for the enemy. This topic is especially relevant because of the enduring requirement to identify mission objectives and prepare airborne forces for an array of operations in the contemporary environment. This monograph looks to answer one primary question: How did US Army airborne forces implement operational art as part of the Normandy invasion?

[1] Joint Publication (JP) 3-18, *Joint Forcible Entry Operations* (Washington, DC: Government Printing Office, November 2012), glossary 6. Vertical envelopment is a tactical maneuver in which troops that are air-dropped, air-landed, or inserted via air assault, attack the rear and flanks of a force, in effect cutting off or encircling the force. The use of aircraft in World War I unleashed the possibility of using vertical envelopment beyond what was already seen with the use of hot air balloons.

[2] Ibid., glossary 4. An airborne operation involves the air movement into an objective area of combat forces and their logistic support for execution of a tactical, operational, or strategic mission.

The research indicates that the US Army's airborne operations, as part of the Normandy invasion, provided General Eisenhower additional operational reach in seizing inland objectives for the amphibious assault forces. Four key attributes of the planning process displayed the strongest factors for success: surprise, management of the operational tempo between the amphibious assault force and the airborne force, synchronization among Allied forces, and the management of risk. The operational objectives identified through the iterative process of mission analysis allowed the operational planners to manage the tension among endurance, momentum, and protection needed to accomplish all assigned missions while also preventing culmination.[3] Overall, the airborne operation denied enemy armored formations access to the amphibious assault force, allowed for a timely expansion of the lodgment, and retained essential lines of communication for a transition to follow-on offensive operations.[4]

This monograph is constructed in six parts. Part one of this study serves as an introduction to the tenets of operational art and operational design that best illustrate the character and requirements needed for successful airborne operations. The specific elements examined include: surprise, tempo, synchronization, and integration of risk mitigation measures. These elements also serve as the framework for the analysis of operational art for airborne operations in the Normandy campaign.

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[3] Army Doctrine Publication (ADRP) 3-0, *Operations* (Washington, DC: Government Printing Office, Nov 2016), 2-9. "The operational reach reflects the ability to achieve success through a well-conceived operational approach. Operational reach is a tether; it is a function of intelligence, protection, sustainment, endurance, and relative combat power. The limit of a unit's operational reach is its culminating point. It balances the natural tension among endurance, momentum, and protection. The *culminating point* is a point at which a force no longer has the capability to continue its form of operations, offense or defense (JP 5-0). Culmination represents a crucial shift in relative combat power."

[4] JP 3-18, *Joint Forcible Entry Operations*, vii. A lodgment is a designated area in a hostile or potentially hostile operational area that, when seized and held, makes the continuous landing of troops and materiel possible and provides maneuver space for subsequent operations. A lodgment is an essential initial entry operations because it is directly tied to expanding the operational reach of a force and preventing culmination. It is typically described in the form of a beachhead, airhead, or combination of the two. In the D-Day operations, the five beachheads (Gold, Juno, Sword, Utah, and Omaha) served as the lodgment.

Part two of this study briefly examines the concept of vertical envelopment as it developed in the interwar period. This includes the initial use of airborne operations by the Soviet and German militaries while also addressing the first combat operations for German airborne forces in 1939 and 1940. An analysis of the doctrine and implementation by foreign entities likely uncovered lessons learned for the US Army, which subsequently had a direct impact on the combat roles for US Army airborne forces.

Part three discusses the US Army's intended purpose for airborne operations. Examining the purpose illuminates the logic used to dictate missions envisioned for airborne units as presented in Field Manual (FM) 31-30, *Basic Field Manual: Tactics and Technique of Air-Borne Troops* from 1942. The airborne missions designated in that field manual illustrate the importance of understanding capability and striving for unity of purpose for airborne forces prior to identifying airborne assault objectives.

Part four translates the US Army airborne operations created through doctrine into a historical case study. The airborne operations in Normandy, France illustrates the missions generated for airborne force in support of the amphibious assault. It also examines the role operational planners participated in identifying assault objectives and providing refinement in mission planning until mission execution to place on June 6, 1944.

Part five examines the achieved effects of airborne operations in Normandy through the use of operational art as a lens for analysis. The operational approach identified by the airborne planners illustrated the importance of integrating surprise, tempo, and synchronization while mitigating risk throughout the entire process. This analysis assists in understanding how the airborne assault impacted the overall success of the operation. Additionally, the Normandy case study displays the operational planners' ability to link tactical objectives in time, space, and purpose.

Finally, this monograph discusses the implications for future airborne operations. How do airborne forces employ their capability better in the contemporary operating environment? This question is solved by looking at the enduring requirements needed for successful airborne operations and examining any potential limitations in the required capability.

This research is a qualitative-based historical analysis. The majority of the research focuses on primary source content. The Combined Arms Research Library (CARL) at Fort Leavenworth, Kansas provided a wide variety of primary sources to include: planning documents, official US Army correspondence, doctrine, and access to military journals. Personal accounts from senior leaders in the airborne community, who took part in the operation, assisted in illustrating the deliberate planning process for the airborne assault in Normandy as well as provided an explanation for how the airborne mission fit into the greater ground tactical plan.

This monograph focuses on the planning and execution of the only two US Army airborne divisions used in the Normandy campaign. This is due to the amount of available space for detailed analysis and the limited access to British planning documents available for analysis. However, this monograph also searches to answer other questions directly tied to the application of operational art with airborne forces in Normandy. What was the original purpose for US Army airborne forces? How did the concept of airborne operations develop? Did the German and Soviet concepts for paratroops directly influence the doctrine and overall use of US Army airborne forces? What missions should those airborne forces perform? Who was responsible for developing the doctrine, and how did the first US Army airborne operations in 1943 impact changes in capabilities and employment techniques leading up to the Normandy airborne operation?

## Part I: Criteria for Successful Airborne Operations

Airborne forces in World War Two conducted a unique type of mission. Airborne forces prepared and inserted an element into a potentially contested enemy strongpoint defensive position.

Once they arrived, elements engaged the enemy in a concentric fashion working from a single point on the ground to an area of battle space several kilometers wide. This required the integration of several characteristics in order to nullify the enemy capabilities: surprise, tempo, and the synchronization of operations. A review of current doctrine as well as the historical doctrine that existed in the 1940s can assist in showing linkages in terms of the planning process and implementation of airborne operations. This comparison will assist in illustrating the importance of operational art in a contemporary environment.[5]

The ultimate goal for the airborne operations in the Normandy operation was to identify ways to seize key terrain and disrupt the enemy formations. This action allowed follow-on Allied amphibious assault forces to seize, retain, and exploit the initiative from the enemy. The German forces occupying defensive positions along the Atlantic wall of the Normandy coast possessed the initiative prior to the Allied invasion. The German forces occupied the key terrain needed for Allied forces to begin a campaign in Western Europe. Therefore, Allied forces identified where enemy weakness could be exploited and establish a lodgment for follow-on breakout operations through the Norman countryside. Successful action created opportunities to pursue German forces deeper into France and Germany. Commanders may not have used the term "operational art" when conducting campaign planning for Operation Overlord, but the planners certainly performed many of the functions associated with the contemporary application of the concept.

Surprise constituted the most critical component in airborne operations. The first two hours of an airborne operation represented a dangerous transition point within the fight. The paratroopers in World War Two operated most often on terrain and against an enemy force unfamiliar to the friendly forces.[6] The airborne force assembled into an assault element, moved to assault objectives,

[5] ADRP 3-0, *Operations*, 4-1. For Army forces, operational art is the pursuit of strategic objectives, in whole or in part, through the arrangement of tactical actions in time, space, and purpose.

[6] US War Department, *FM 31-30, Basic Field Manual: Tactics and Techniques of Air-Borne Troops* (Washington, DC: Government Printing Office, 1942), 31. Parachute troops are troops moved by air transport and landed by means of parachutes. These are different from troops which are delivered by air-land

and seized key terrain before the enemy could react. Therefore the airborne force embraced the mantra, "Strike at a time or place or in a manner for which the enemy is unprepared."[7] The effect of achieving surprise forced the enemy into a reactive nature, taking the initiative away and creating confusion on the battlefield. The ensuing friction created then caused the enemy to question the disposition, composition, and intent of the airborne force. If properly executed, the enemy commander facing an airborne operation reported improper information, which directly affected the ability to inform senior level commanders of the apprising situation. These effects cumulatively impacted the decisions regarding the positioning of reserve elements and relieved pressure from the friendly decisive operation.

Tempo presented another critical element for airborne operations. The airborne commander attempted to penetrate the enemy decision-making cycle through the choice of objectives and identifying a plan to sequencing those objectives to gain the initiative. ADRP 3-0 defines tempo as, "the relative speed and rhythm of military operations over time with respect to the enemy."[8] The speed of airborne operations, ideally aided by surprise, harnessed the ability to seize objectives and control the enemy before he fully alerted his subordinate units. The majority of airborne operations in World War Two and in the contemporary environment attempted to use the cover of darkness to take the advantage of physical visibility away from the enemy. Limited visibility operations also facilitated the attack of an enemy force when the majority of his soldiers were conducting normal rest or refit operations.[9]

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operations.

[7] *ADRP 3-0, Operations*, 2-2.

[8] Ibid., 2-7.

[9] US War Department, *A Graphic History of the 82nd Airborne Division: Operation Market Garden, Holland 1944* (HQ, 82 Airborne Division: Feb 1946), 4. Market Garden, following the invasion in Normandy, was the first combat airborne operation by Allied forces which chose to conduct the airborne assault during daylight hours. The Pathfinder teams were inserted at 1250 with the main body arriving just ten minutes later at 1300. This scheme of maneuver proved effective in Holland, but would have proven less than advantageous given the terrain and enemy dispositions in the Norman countryside.

A more detailed examination of tempo should also include the duration of the operation and the frequency for an operational unit, which plays directly into preventing culmination for the airborne force. Airborne forces can typically conduct operations for forty-eight hours with very little rest in order to ensure the disruption effect is achieved for the decisive operation. However, at the end of that forty-eight hour window, the airborne force will require logistical class I (food and water) and class V (ammunition) resupply. In almost every operation in World War Two, a resupply operation was conducted by either ground or air elements within the first twenty-four hours.[10] Therefore, the logistical plan becomes just as important in maintaining tempo as paratrooper rest management and controlling the seizure of terrain or enemy-based objectives.[11]

Just as important as getting a force where one wants it and at the proper time, simultaneity and synchronization became essential elements for airborne operations.[12] Airborne forces possessed the capability to overload enemy decision-making through the simultaneous creation of multiple dilemmas. If the airborne operation was not achieved with a degree of simultaneity, then the objectives could be isolated and defeated one at a time by the enemy commander. Therefore, the airborne scheme of maneuver positioned paratroopers on multiple drop zones (DZs) throughout the enemy battle space with no early warning, forcing the enemy commander to make rapid choices on where he committed his force based upon his tacit understanding of the situation. The simultaneous

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[10] James M. Gavin, *Airborne Warfare* (Washington, DC: Infantry Journal Press, 1947), 19. "There must be full coordination with the amphibious troops and with the naval and air forces. Coordination for bombing and fighter support is especially vital and air resupply may be equally so."

[11] James M. Gavin, *On to Berlin: Battles of an Airborne Commander 1943-1946* (New York, NY: The Viking Press, 1978), 111. The management of paratrooper rest cycles proved critical in preventing culmination. General Gavin discussed the importance of rest cycles and preventing exhaustion of key leaders. Key leaders are often guilty of working themselves non-stop for the first forty-eight hours during an airborne operation. This was the case with both the Division Commander (General Matthew B. Ridgeway) and the Assistant Division Commander (General James M. Gavin) of the 82nd Airborne Division. General Ridgeway states in his memoirs, "Just before midnight, tottering on my feet as many another soldier who had fought there on that day, I rolled up in a cargo chute and lay down for the first sleep I'd had in forty-eight hours." Deliberate efforts need to be made to prevent overworking of all personnel from the enlisted private to senior leaders. Lack of sleep slows reaction time in combat and exacerbates poor decision making.

[12] ADRP 3-0, *Operations*, 2-14. Synchronization is the arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time.

massing among multiple objectives overloaded the enemy commander with multiple dilemmas and thereby forced him into a reactive state. In order to achieve the simultaneous action, the lift component of the operations integrated all key enablers to ensure pre-assault fires, delivery of friendly forces to their target desired DZ, and coordinated resupply operations, all while ensuring subsequent operations are correctly timed and de-conflicted in sequence.

Airborne operations are inherently risky in nature. JP 5-0 defines risk as, "the probability and severity of loss linked to hazards."[13] Like most military operations, the payoffs anticipated upon completion of the operation must outweigh the potential cost associated. Parachute operations have elements of accidental risk, especially due to the nature of static-line operations from a moving aircraft, but they also incur risk to mission due to a vulnerability to armored formations and the lack of cover associated with a vertical envelopment.[14] As stated in FM 100-5 from 1941, "they [airborne operations] constituted a powerful surprise factor and usually are employed in conjunction with air landing or mechanized troops in the path of the main ground effort, or close in rear of the enemy front line; otherwise they may be quickly surrounded and destroyed."[15] Airborne operations in World War Two represented a tradeoff of operational advantages with increased amounts of risk. The operations placed a force in a potentially hostile environment with very minimal ability to re-enforce or extract those forces from the battlefield, but the operations also increased the Allied assault force's ability to seize key terrain and protect the assault force while exiting from the beachheads. In the end, the Allied commanders deemed the airborne operation necessary for success.[16]

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[13] JP 5-0, *Joint Operation Planning* (Washington, DC: Government Printing Office, Aug 2011), A-2.

[14] Gavin, *Airborne Warfare*, 41.

[15] US War Department, *FM 100-5, Basic Field Manual: Tactics and Techniques of Air-Borne Troops* (Washington, DC: Government Printing Office, 1941), 241.

[16] Gavin, *On to Berlin: Battles of an Airborne Commander 1943-1946*, 94. Despite several attempts from staff officers, such as British Air Chief Marshal Sir Trafford Leigh-Mallory, to talk Eisenhower out of the airborne assault, Eisenhower accepted that the airborne operation was worth the risk. The original

## Part II: Pioneers of Vertical Envelopment

The integration of airborne forces in combat operations was a relatively new concept in World War Two, and the United States was not the first country to explore the use of paratroopers. The interwar period drove innovation and expanded the role of aircraft, and subsequently inspired the quest to leverage aircraft to deliver soldiers into battle. The concept of dropping paratroopers in depth beyond the traditional capabilities of either vehicular or dismounted maneuver would soon be within the grasp of military commanders. As Benjamin Franklin asked as early as 1784, "Where is the prince who can so afford to cover his country with troops for its defense as that ten thousand men descending from the cloud might not in many places do an infinite deal of mischief?"[17] The Soviets, in conjunction with their emerging doctrine in the 1920s, attempted to find ways to attack the enemy along a broad front as well as in depth. By 1941, the Soviet army had five airborne corps with a total strength of 50,000 soldiers, but their commanders struggled with implementing airborne forces as part of a large scale operation.[18] It is important to look at the origins of vertical envelopment and the airborne missions envisioned by pioneers of the concept in order to illustrate the United States' development of similar capabilities.

The first inception of airborne operations started near the end of World War One. Brigadier General William "Billy" Mitchell, a US Army officer, suggested the use of airborne forces as a method to end the problem of the stabilized front through vertical envelopment.[19] In theory, the use

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intelligence estimates showed that American units would suffer as much as seventy percent losses in glider units and fifty percent losses in parachute strength.

[17] Barry Gregory and John Batchelor, *Airborne Warfare: 1918-1945* (New York, NY: Exeter Books, 1979), 8.

[18] Ibid., 27. Even Marshal Tuchachevski, an advocate of deep battle doctrine and armored warfare, supported Soviet paratroopers. However, his death during the Stalin purges prevented further integration of the concept**.**

[19] Maurice Tugwell, *Airborne to Battle: A History of Airborne Warfare 1918-1971* (London, England: William Kimber, 1971), 18. Some theories of airborne warfare trace their concepts back to the days of Napoleon and his vision of transporting troops across the English Channel by balloon. Additionally, General William Mitchell, a Colonel during World War One, saw airborne operations as a way to combat the challenges associated with warfare along a stabilized front. General John J. "Blackjack" Pershing, the

of airborne forces provided the ground force commander with a multitude of options with which to increase the depth of the battlefield. [20] However, the concept required intense resourcing, training, and planning to implement such a concept. The Army Air Force struggled with funding as well as the challenges of keeping up with aircraft development.[21] As a result, the idea lost momentum and was forgotten within the US military community until the middle of the 1930s.

The Soviets instituted the first mass-tactical drops of paratroopers in 1935. They developed a plan to drop paratroopers in a manner that went beyond a mere scattering of commando forces. This new method allowed for battalion-sized formations of up to 1,000 soldiers to descend upon a single objective. Additionally, the massing of forces upon a single point allowed for Soviet paratroopers to consolidate upon landing and instantly transition into the role of a light infantry battalion.[22] This method of creating mass and concentrating at a decisive location and time would become the trademark for further US Army airborne planning and execution.

The Germans saw the utility in expanding the capability of these new mobile formations. German fallschirmjaeger, an extension of the Luftwaffe, allowed ground forces to present a new dilemma for opposing forces.[23] The ability to project infantry formations beyond the Forward Line of Own Troops (FLOT) created operational level issues for the defending force. The employment of airborne forces allowed a commander to avoid strongpoint defenses and attack any point on the

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American Commander-in-Chief in Europe, disapproved of the concept and abandoned any further pursuit of vertical envelopment in World War One.

[20] James Lucas, *Storming Eagles: German Airborne Forces in World War Two* (London, Great Britain: Arms and Armour Press, 1988), 8. The *Wehrmacht* is the name for the German unified armed forces from 1935 to 1946. The term *Luftwaffe* describes the German Air Force from 1933 to 1946. The term *Heer* represents the German land component of the armed forces from 1935 to 1946.

[21] Tugwell, *Airborne to Battle*, 157. The US Army Air Force did not have enough C-47 aircraft to get all of the US and British personnel to Sicily. Aircraft allocated for all airborne operations would prove to be a challenge, but especially in joint operations.

[22] Lucas, *Storming Eagles*, 8.

[23] Ibid., 11. Fallschrimjaeger is the term designated for German paratroopers. The terms literally combines the concept of a parachutist with that of a hunter.

battlefield that was vulnerable to aircraft penetration. Contrary to military clauses of the Versailles Treaty, Adolph Hitler initiated a plan in 1935 to develop aircraft and personnel training to accomplish parachute assaults.[24]

The German forces instituted two main missions for airborne forces. First, airborne forces could air-land as part of a larger Wehrmacht task force. This type of mission was planned, resourced and sustained through the Luftwaffe. The airborne forces would then link up with other maneuver ground forces and thereby transfer operational control of the forces from the Luftwaffe to the Wehrmacht. American forces would later attempt to refine the mission command component of this type of operation and keep the airborne forces all under the operational control of the Army.[25]

A second task called for the air-landing of airborne forces in very small groups to seize military objectives in support of Luftwaffe missions. This airborne mission employed forces for objectives deemed too small for large scale bombing operations because the effects would be disproportionate to the resources allocated. This operation used stealth and an economy of force mentality to achieve the mission objectives.[26] This decentralized form of employment inherited additional risk, but it also generated more operations for exploitation of weakness. This method of employment was also referred to as the "drops of oil" technique because it often called for multiple airborne landings to take place simultaneously throughout the battlefield. Once the paratroopers were on the ground, the weakest point in the enemy defenses triggered the further reinforcement of positions on the ground massing at a decisive point for follow-on exploitation by ground based

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[24] Tugwell, *Airborne to Battle*, 26. The Germans developed a secret military treaty with Russia, the Treaty of Rapallo of 1922, which attached German liaison officers to the Soviet Army and Air Force. This treaty exposed the German military leadership to the concepts of airborne operations which later led the Germans to explore the capability in 1935. The German civilian airline company Lufthansa received a tasking to develop an airframe that was capable of converting into a bomber or military transport role. The JU-52 Junkers resulted from the experimentation and became the core of the German airborne workhorse.

[25] Lucas, *Storming Eagles*, 10.

[26] Tugwell, *Airborne to Battle*, 27. A single parachute battalion was created for this special type of mission. The battalion reported directly to the Luftwaffe Hermann Goering Regiment for training and employment.

forces.[27] These two methods of employment created options for the commanders because it now allowed for the ability to bypass re-enforced defensive positions. Airborne operations also improved the strategic mobility of a light infantry force. A lightly armed infantry force provided opportunities for employment just as soon as aircraft and personnel could prepare for a developing operation.[28] It was now up to the military commanders to further refine the employment methods and prepare for their first test in combat.

The German airborne forces exceeded the capabilities of Soviet airborne forces and delivered combat power to the battlefield through three different methods. The first option deployed forces directly from a transport aircraft by parachute.[29] This method was useful because it allowed paratroopers to seize a piece of terrain or attack an enemy unit virtually unimpeded. The second method of delivery used gliders as the primary means to bring soldiers to fight. The glider method allowed for the landing of heavier equipment and weapons which proved critical for light infantry forces. The glider method also added the benefits of stealth and precision mass on an objective. However, this method was also more vulnerable to anti-access obstacles emplaced on the ground and presented challenges in terms of resourcing additional glider aircraft and pilots. Lastly, the German commanders employed the air landing of transport aircraft on the ground with paratroopers able to deploy once safely on the ground.[30] This last method required significant preparation of an

[27] Lucas, *Storming Eagles*, 11.

[28] Tugwell, *Airborne to Battle*, 23. The author identifies five positive attributes for airborne forces. First, airborne operations supported missions from almost any type of transport aircraft. Secondly, airborne forces provided a timely and flexible element for fighting. They were equipped and prepared to engage the enemy within a very short period of time. Thirdly, aircraft do not need to land and therefore can vary their drop altitude according to different enemy threat levels. Fourthly, parachute forces provided access to severely restricted terrain. Fifthly, airborne operations presented nighttime delivery options because air-landing forces was not a requirement.

[29] Ibid., 64. In May 1940, the Germans were finishing training for the 7th Air Division. This division consisted of three parachute regiments with all the supporting arms and services.

[30] Bruce Quarrie, *German Airborne Divisions: Blitzkrieg 1940-41* (Oxford, United Kingdom: Osprey Publishing, 2004), 12. The 22nd Luftlande Division was the primary forced used for German air-landing operations. The division operated similar to a mechanized infantry unit, except the force proved to be extremely vulnerable due to the necessity for an airstrip and the lack of firepower available for protection on

objective area to ensure enemy resistance is minimal and almost always necessitated the use of an enemy controlled airfield.[31]

The morning of April 9, 1940, illustrated the capability of airborne operations in an offensive operation. The Germans conducted two parachute operations in Denmark. One German element seized the long bridge linking the Gedser ferry terminal to Copenhagen. A second German unit seized an additional ferry terminal at Aalborg. The seizure of these two objectives isolated the Jutland Peninsula and secured its important airfield for future operations in just four hours. These historical examples served as the first two military airborne operations in history, and the operations illustrated the unique capability of high tempo offensive operations and the opportunities of vertical envelopment when used in conjunction with other land-based and sea-based forces.[32]

The Germans also introduced the idea of glider assaults as they conducted operations in support of capturing the Belgian fortress of Eben Emael, which lay at the junction of the Meuse and the Albert Canal. This tactical action within the first few hours in the Battle of France in 1940 proved critical to securing avenues of approach and seizing pieces of key terrain. The glider provided the capability for silent approaches to objectives and the ability to get more than a squad's worth of personnel on an objective at a single point.[33] Glider forces, in conjunction with additional parachute forces in support of Army Group A to the south, allowed for a powerful disruption effect. US airborne forces would later attempt to replicate each of these effects in Operation Neptune, which served as the name for the initial assault phase of the Normandy invasion.[34]

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the JU-52 aircraft.

[31] Lucas, *Storming Eagles*, 12.

[32] Robert M. Citino, *The German Way of War: From the Thirty Year's War to the Third Reich* (Lawrence, KS: The University Press of Kansas, 2005), 271.

[33] Ibid., 271.

[34] Carlo D'Este, *Decision in Normandy* (New York, NY: Konecky & Konecky, 1983), 34, 68. Operation Overlord was the overall name for the entire operation to liberate Northwest Europe. However, there were several other sub-operations which were given separate naming conventions. The airborne operations for the 82nd and the 101st Airborne Divisions were given the names Boston and Albany, respectively. Neptune was used to describe the combined amphibious and airborne assault forces occupying

Overall, the developments of the Soviet and German airborne forces in the 1930s and the early part of the 1940s played an essential role in defining force composition and tactical mission tasks which would later be adopted by United States airborne forces in World War Two. The US forces, as well as the rest of the Allied forces, began to see the operational advantages of vertical envelopment. The airborne forces, even in the earliest stages of use, were seen as a new tool for expanding the scope and depth of offensive operations. The ability to seize multiple objectives simultaneously throughout the depth of the enemy commander's Area of Operations (AO) presented tactical as well as strategic level opportunities. The psychological effects also played a significant role in disorienting the enemy forces and questioning morale. Lastly, airborne operations disrupted the enemy forces commanders' abilities to visualize the composition, disposition, and tactical tasks given to the unit. This effect, in turn, aided US forces in developing similar capabilities which would serve as an essential shaping operation for the Normandy invasion.

## Part III: The Purpose for US Army Airborne Forces

Although the first airborne test platoon began experimenting with airborne operations in 1940, it was not until 1942 when Brigadier General William Lee pursued the creation of the first United States airborne force.[35] The decentralized concept of airborne operations presented a significant set of tactical and logistical concerns for the airborne commander. Planners traditionally chose a ground-based maneuver element to serve as the decisive operation. The decisive operation was typically task organized as a mechanized or motorized force to accomplish the essential mission task. The amphibious assault force served as the decisive operation in the Normandy

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the Caen-Cotentin sector.

[35] Tugwell, *Airborne to Battle*, 134. The original airborne concept was driven by then LTC William Lee. He established the first parachute group which was in charge of resourcing equipment such as parachutes, developing training schedules, and forming the tactical doctrine for US airborne forces.

invasion. Airborne operations served instead as a shaping operation.[36] The airborne force seized key objectives beyond the proposed landing site in order to set the conditions for the securing of a lodgment.

The United States was just beginning to experiment with the capabilities of vertical envelopment, but General Lee identified the need to develop a training plan for airborne forces that organized subordinate units and combat power to operate independently upon hitting the ground. The airborne force often maneuvered and conducted link-up operations with larger organizations allowing the decisive operation freedom of maneuver to meet follow-on objectives. Therefore, the airborne concept required a new method of training that was counter to the majority of the training strategies seen during the interwar period of 1918 to 1941. Small unit tactics from squad to company-sized elements emphasized disciplined movement and maneuver. However, the resiliency of the airborne solider and the capability to self-sustain for multiple consecutive days became a central tenant for successful airborne operations.[37]

In order to construct a new airborne operation, the US Army needed to identify a division-sized organization whose sole purpose would be oriented on implementing the new concept of vertical envelopment. The 82nd Division stationed at Camp Claiborne, LA served as the first airborne unit for the US Army. The original concept used two parachute regiments, one glider-borne regiment, and the associated equipment that allowed for employment through either parachute or glide-borne insertion techniques.[38]

Following the blueprint for the German use of airborne forces in combat, the United States researched the development of their own airborne missions and desired capabilities. According to

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[36] ADRP 3-0, *Operations*, 4-6. Decisive, shaping, and sustaining operations represent just one of the available battlefield frameworks as part of the Army operational framework model. The decisive operation is the operation that directly accomplishes the mission. The shaping operation is an operation that establishes conditions for the decisive operation through effects on the enemy, other actors, and the terrain.

[37] Gavin, *On to Berlin*, 2-3.

[38] Ibid., 3.

FM 31-30 from May of 1942, "parachute troops are specially trained, equipped, and organized for the purpose of executing missions in areas not immediately accessible to other friendly troops."[39] The field manual also discussed several different operational effects envisioned for airborne forces which constituted the primary missions for the new force. Although this manual was relatively new, published just six months before the first US Army combat airborne operation in North Africa, the missions proved very similar to those employed by German forces in Norway, Denmark, and Holland within the first two years of World War Two.[40] There were four different types of missions specified in FM 31-30 that directly applied to the airborne operation in Normandy, focused on seizing landing zones for follow-on glider assaults, seizing key terrain for the decisive operation, seizing waterway crossing and defiles, and creating a disruption effect on the enemy.

The first mission for parachute troops identified, "seizing and holding terrain suitable for the landing of troop carrying airplanes or gliders."[41] This mission served a vital role when link-up with a larger ground based force was tactically unfeasible, or when the terrain did not support ground avenues of approach and required delivery of additional combat power by aircraft. The drawback to this method of delivery was that it placed the follow-on aircraft and associated forces in jeopardy unless planners identified an alternate landing zone (LZ). However, this mission allowed forces to gain access deep within enemy-held territory and presented the capability of circumventing elaborate enemy defenses.

The second type of mission in FM 31-30 identified, "seizing and holding waterway crossings and defiles."[42] This type of mission proved to be extremely relevant for the 505th

[39] US War Department, *FM 31-30*, 31. This was one of the first manuals looking at the missions and task organization of air-land and parachute troops. The manual discussed characteristics, training, logistics, and tactical employment of parachute units.

[40] Citino, *The German Way of War*, 271.

[41] US War Department, *FM 31-30*, 31.

[42] Ibid.

Parachute Infantry Regiment in their seizure of Merderet river crossings.[43] Waterway crossings and defiles formed natural and manmade choke points that forced an attacking or defending force to change their movement formations and techniques to negotiate an obstacle. The waterways also separated land masses which isolated forces. This created key terrain for the attacker because it provided the most direct route to additional sub-objectives. However, it also served as key terrain for the defender because it denied the enemy a vital avenue of approach needed to pass a reserve force.

The third type of mission called for "seizing and holding of key terrain in the rear of organized beach defenses in conjunction with ground or naval operations."[44] This mission represents the preponderance of objectives for the airborne operations in World War Two, and proved extremely relevant given the type of anti-access characteristics that Allied forces faced along the coast line in northern France. Landing areas on the beach, as well as key inland objectives, were heavily defended and required opposed landings. US airborne forces moved to link up with the arriving amphibious forces landing on the beach following the seizure of initial enemy strongpoints, waterways, and avenues of approach. As General James Gavin, Assistant Division Commander for the Normandy operation, stated, "Airborne units are especially suitable for seizing key terrain and blocking the movement of enemy reserves. They are also a means of very rapidly reinforcing a seriously threatened major operation. If properly trained they can paralyze the enemy's nerve system, his communications."[45]

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[43] Gavin, *On to Berlin*, 98.

[44] US War Department, *FM 31-30*, 31.

[45] Gavin, *Airborne Warfare*, 35. Airborne operations presented a steep learning curve in terms of employment and range of missions they could accomplish. There were three lessons learned that emerged from combat operations in Italy that impacted future planning. First, airborne forces are best employed in mass, not in small pockets. Secondly, airborne forces performed well when seizing key terrain. Lastly, airborne forces can serve as a reserve element and reinforce a seriously threatened major operation. These critical points aided the Normandy planners in identifying mission objectives.

The fourth mission identified in FM 31-30 was relevant in every airborne operation. This mission focused on "creating confusion and acting as a diversion to the operations of the main force."[46] The disruption effect, coupled with the surprise achieved upon landing, was the key to effective airborne operations. The enemy commander should be presented with multiple dilemmas. These dilemmas created a form of paralysis in the enemy decision-making cycle and created additional time and space for the main effort to secure a foothold and transition combat power off of the canalized beachheads. In order to achieve mission success, airborne planners needed to integrate all four of these missions into the plan simultaneously.

# Part IV: Normandy Case Study

## Allied Forces Preparation

The airborne operational concept in Normandy was the direct result of two years of combat training and two airborne operations previously conducted in Sicily and Salerno, Italy. These airborne assaults helped identify the capabilities and limitations of an airborne assault force. Specifically, the operations in Sicily assisted in identifying the ideal types of airborne objectives and correct methods for task organizing airborne forces. In previous airborne operations, the ground force commander chose to employ forces in a decentralized manner allowing for battalion sized elements to mass along multiple locations. Given the amount of enemy intelligence in a particular area, the decentralized method allowed for key pieces of terrain as well as enemy points of resistance to be neutralized simultaneously.[47]

Additionally, the scattered method in which paratroopers from the 505th Parachute Infantry Regiment descended into Sicily drove a requirement for the development of pathfinder teams. The pathfinder concept constituted a ten man team that would land approximately twenty minutes

[46] US War Department, *FM 31-30*, 32.

[47] Gavin, *Airborne Warfare*, 35.

before the lead echelon of aircraft arrived on the drop zone. The aircraft dropping the main body of paratroopers would receive an electronic and visual signal from the pathfinder teams indicating a vector to bring aircraft onto the correct drop zone. This new concept would allow for massing of paratroopers, thereby increasing the survivability and efficiency in assembling for movement to follow-on objectives.[48]

The use of pathfinder teams was very successful, but it did not solve the problem of finding suitable drop zone locations that were free of obstacles and enemy positions. The intelligence officers and intelligence collection methods provided valuable information on the disposition and composition of friendly forces. The 505th Parachute Infantry Regiment, during the first regimental sized US airborne assault, was surprised to find elements of the Hermann Goering Panzer Division on their objective at Biazza Ridge during the Sicily operation.[49] As a result, the airborne community understood the value of picking suitable DZs, providing heavier and yet practical weapon systems, and identifying the enemy formation to avoid inserting a force onto a prepared enemy defense.

The Army Air Force capitalized on lessons learned from trooper carrier operations in Sicily and Salerno. General Lewis Brereton, commander of the Ninth Air Force, implemented tactical exercises in England, such as Exercise Eagle, aimed at testing the validity of the pathfinder concept.[50] The Army Air Force also created the IX Troop Carrier Command to manage the training and organization for the upcoming complex airborne operation. The Air Force command attempted to create habitual working relationships with each of the United States airborne divisions. The 82nd

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[48] Gavin, *On to Berlin*, 50, 90. Lessons learned from the combat actions in Sicily and Italy really drove the need for innovations in doctrine. James Gavin wrote one of the first airborne training manuals to standardize American airborne practices called "Training Memorandum on the Employment of Airborne Force." The document, written in late 1943, attempted to give some structure to operational employment of airborne forces as well as standardize airborne terminology and tactical application. This significantly helped General Gavin when we was assisting the Chief of Staff to the Supreme Allied Commander (COSSAC) staff on development an airborne concept for the Normandy invasion.

[49] Ibid., 30.

[50] Edwin P. Hoyt, *Airborne: The History of American Parachute Forces* (Briarcliff Manor, NY: Stein and Day/Publishers/Scarborough House, 1979), 50.

Airborne Division received support from the 52nd Wing and the 101st Airborne Division worked with the 53rd Wing whenever possible.[51] These relationships aided in providing flexibility to changing conditions, built mutual trust, and created shared understanding between the ground and air elements.

The airborne division task organization underwent several changes in terms of force structure, which enabled the success of the airborne operations in the Normandy campaign. Beginning in 1942, each airborne division was assigned a single PIR and two GIRs. [52] The airborne concept continued to struggle with the massing of multiple regiments simultaneously due to the Army Air Force's limited supply of aircraft for transport and glider towing operations. The concept supported the ability to accomplish initial entry operations with a single regiment and then built additional combat power through the air-landing of glider-borne forces. This was similar to the employment methods used by the Germans in Denmark in order to secure important airfields and the seizure of enemy strongpoints in the Battle for France in 1940. However, this force structure slowly changed as World War Two continued to progress.

The commanders of the two US airborne divisions required additional combat power due to the number of potential objectives identified and the potential of being isolated by enemy forces prior to the amphibious landing conducting link-up operations. Therefore, the airborne divisions conducted the operation with three PIRs and one GIR.[53] This reinforced the airborne leadership's viewed importance of surprise and getting as much combat power on the ground as quickly as

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[51] Ibid., 50.

[52] US War Department, *Table of Organization No. 71, Airborne Division* (Washington, DC: Government Printing Office, 15 October 1942), 2-3. The Parachute Infantry Regiment (PIR) as part of the triangular division consisted of three battalions. Each battalion had three companies, and each company consisted of three platoons. The original concept for the Airborne Division called for two GIRs and a single PIR.

[53] Tugwell, *Airborne to Battle,* 135. The original concept for the airborne division with two glider and one PIR was believed to be a misunderstanding between BG Lee and the Department of War. Four PIRs were already in existence when the Table of Organization (TO) was created, and therefore only two GIRs needed to be raised.

possible to overwhelm the enemy commander. By December of 1944, the *Airborne Division Table of Organization* allocated two PIRs and a single GIR.[54]

## German Forces Preparation

Before looking at the implementation of operational art for the US airborne forces, it is first essential to describe the enemy defensive plan and examine the framework used for German decision-making. The German Oberkommando der Wehrmacht (OKW), which served as the headquarters element for planning future operations, saw the French coastline as decisive terrain.[55] A foothold on the continent of Europe was essential for Allied breakout operations. Following the failed attempts to neutralize the Soviet threat on the Eastern front with Operation Barbarossa, Adolph Hitler saw even more need to prevent the operational access of Allied forces on the Western front.[56] Hitler reinforced the importance of the French held coastline by reorganizing his command elements in charge of overseeing coastal defense.[57] Field Marshal Gerd von Rundstedt served as the German commander in the West, but the French coastline was deemed so vital that Hitler positioned one of his top Panzer commanders, Field Marshal Erwin Rommel, to take

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[54] US War Department. *Table of Organization No. 71, Airborne Division*, 2-3.

[55] Army Techniques Publication (ATP) 3-91, *Division Operations* (Washington, DC: Government Printing Office, October 2014), 6-29. The division must control decisive terrain within its area of operations to successfully accomplish its mission. According to paragraph 6-29 in reference to the division level conduct of tactical maneuver, "If decisive terrain is present, commanders designate it to communicate its importance in their concept of operations, first to their staffs and later to subordinate commanders."; ATP 3-91, 5-1. The *Division Operations* publication also lists retaining decisive terrain as a key task for division level defensive operations.

[56] Geoffrey P. Megargee, *Inside Hitler's High Command* (Lawrence, KS: University Press of Kansas, 2000), 145. Following issues with Operation Barbarossa, Hitler placed himself in command of the OKW on December 19, 1941. This action placed Hitler in a unique position where he could control political objectives, strategy, and even tactical problems. However, unlike Napoleon, Hitler would struggle with the command and control of such a large military force. This convoluted command structure showed itself on the morning of June 6, 1944 as subordinate commanders feared to wake Hitler, notify him of the Allied landings, and commit strategic armored forces which had the capability of containing the initial invasion efforts.

[57] Stephen E. Ambrose, *D-Day June 6,1944: The Climactic Battle of World War II* (New York, NY: Touchstone, 1994), 28. The Fuehrer Directive No. 51 stated, "The threat from the East remains, but an even greater danger looms in the West: the Anglo-American landing!"

command of Army Group B, which consisted of approximately 500,000 soldiers charged with defending almost 800 miles of coastline from Holland to the shores of the Brittany peninsula.[58] This massive area forced Field Marshal Rommel to make decisions on where to defend the strongest point, the Pas-de-Calais, and where to accept more risk along the Normandy coastline.

Field Marshal Erwin Rommel proved to be essential in improving defensive oversight. He focused on the disposition of defensive units, but he also energized commanders in the tactical emplacement of obstacles. This included refinements to the positons of artillery units and coastal batteries, engagement area development for dismounted forces, and the flooding of areas to deny vertical envelopment employment options. However, Rommel and Gerd von Rundstedt disagreed on the disposition and concept for employment of German forces. Rommel favored German forces massed along the beachheads and stopping any potential attack at the coastline while Gerd von Rundstedt favored the centralizing of reserves away from the beachheads. [59]

Field Marshal Rommel identified the issue of allied operational reach and saw the danger of allowing Allied forces to establish a logistical base of operations, which would cede the initiative to the Allies and set the conditions for forward-based operations. Field Marshal Rommel's experience in North Africa, against British Field Marshal Bernard Montgomery, taught him that a failure to stop the Allies from seizing a lodgment for forward-based operations could bring decisive defeat. Rommel had also experienced the awesome air power the Western Allies brought as part of the fighting in North Africa. Many other German commanders, to include Gerd von Rundstedt, had not experienced this air-land battle approach to warfare.[60] Therefore, Field Marshal Rommel

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[58] Cornelius Ryan, *The Longest Day: June 6, 1944* (New York, NY: Simon and Schuster, 1959), 14.

[59] Ambrose, *D-Day June 6,1944*, 36-38. Hitler became obsessed with the composition and disposition of the coastal defenses. He became very familiar with the positioning of coastal defense units and bunkers, and he even received regular reports on defensive construction to include intricate details on the thickness of concrete and the types of steel reinforcement used in the bunker complexes.

[60] Gordon A. Harrison, *Cross-Channel Attack* (Washington, DC: Center of Military History, US Army, 1951), 25, 38. Although the British saw initial defeats against Rommel's forces at Knightsbridge in Libya, they eventually defeated Rommel's forces through the integration of mechanized forces and airpower.

favored a rapid counterthrust that would isolate any Allied logistical resupply and prevent Allied armored formations from reaching Cherbourg. Rommel understood that once the Cotentin Peninsula was secured, the German forces would struggle to stifle Allied tempo and prevent Allied forces from conducting breakout operations into Brittany.[61]

On the contrary, Gerd von Rundstedt favored a plan to allow forces to occupy the beachheads and then unleash a panzer strike force to destroy the Allied assault force. Rundstedt believed that the superior power and concentration of a panzer counterattack would be more effective than spreading a force along the entire coastline. Additionally, many of Rommel's forces were comprised of "Ost Soldaten," who were primarily made up of injured replacement soldiers from the Eastern front or elderly Germans from the reserve force.[62] Ultimately, the plan employed a hybrid-approach and confusion on who commanded the defending force and authorities for the committal of reserve forces would plague the German commanders from the onset of the battle.[63]

[61] D'Este, *Decision in Normandy*, 34, 68. The Norman coastline lay over four hundred miles from the headquarters of the Third Reich, and German reinforcements would take days in order to reinforce German forces isolated in Normandy. Allied forces would control the tempo of operations if a lodgment secured.

[62] Harrison, *Cross-Channel Attack*, 141. Gerd von Rundstedt stated that, "it was a matter of policy that the west should be permanently garrisoned only by troops who because of various disabilities could not be used in the hard fighting in Russia. As far as troop numbers and reallocation of combat power, "the OKH, in October 1943, proposed a regular monthly exchange of two divisions between *Army Group Center* and *OB WEST* and one division between *Army Group North* and the Norway garrison. The OKH listed ten infantry divisions under *OB WEST* command which were immediately suitable for exchange with the east."

[63] Ambrose, *D-Day June 6,1944*, 37, 68-69. The German commanders still favored the spirit of the offensive and searched for ways to bring about a decisive battle. The dissention among commanders reinforces the need for shared understanding and free dialogue in order to build a plan that can be executed violently.

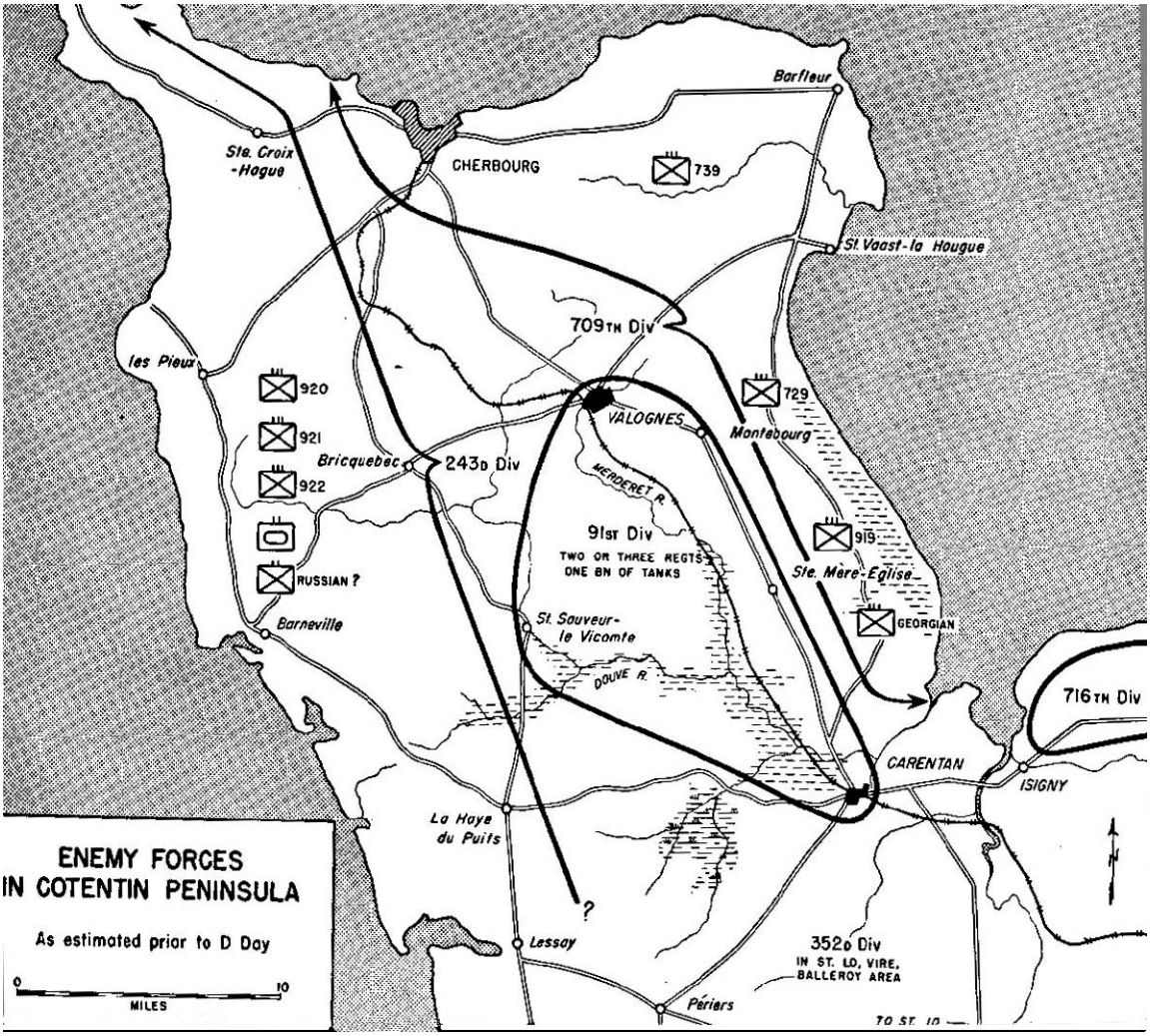


Figure 1. Enemy Forces in Cotentin Peninsula. United States Army, *Utah Beach to Cherbourg: 6 June – 27 June 1944* (Washington, DC: Center of Military History), 2, accessed 16 December 2016, http://www.history.army.mil/books/wwii/utah/maps/MAP1.JPG.

The German high command focused on the majority of the amphibious threat coming from the Pas de Calais across the Strait of Dover. This area of Northern France was the shortest distance to England and would require the least amount of Allied logistical support network. In addition to the terrain factors, the allies developed a deception operation that presented a buildup of formations along the English coastline opposing Calais under the command of General George S. Patton. The Germans feared the speed in which Patton had employed his forces in both North Africa and the

Sicily operations, and therefore, the German commanders assessed that the Allied main effort would reside somewhere with General Patton's Forces.[64]

## Planning the Airborne Operation

In anticipation of conducting a Joint Forcible Entry (JFE) operation in Western Europe, the Chief of Staff to the Supreme Allied Commander (COSSAC) conducted mission analysis on the terrain, enemy, and logistical considerations necessary to facilitate planning.[65] On July 7, 1943, the COSSAC future operations section released the initial planning document for Operation Overlord. The document illustrated the importance of choosing a landing location which was favorable for ports, airfields, basing operations, and also introduced the significance of deception operations in the overall scheme of maneuver. Airborne forces were specially viewed as being vital in the seizure of key towns, neutralization of certain coastal defenses, and seizure of river crossing sites. Accomplishment of these objectives added depth and breadth to the lodgment for the Allied forces. Operational planners identified the seizure of objectives in order to place Allied forces in a general perimeter defense along the French towns of Grandcalp, Bayeux, and Caen. [66] The plan further emphasized the importance of tactical surprise and the requirement to build combat power faster than German forces reinforcements. Overall, the COSSAC documents served as a blueprint for maneuver and initiated a set of planning assumptions and aspirations for future planning.[67]

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[64] Gavin, *On to Berlin*, 123. The Allied planning staff saw how critical the deception operation would be to achieving tactical surprise. A complete field army of communications established with Patton's headquarters element to present the volume of traffic needed to sell the deception plan.

[65] Ambrose, *D-Day June 6, 1944*, 71.

[66] COSSAC Planning Document, *Digest of Operation Overlord* (Washington, DC: Combined Arms Research Library Archives, Fort Leavenworth, KS, 7 July 1943), 1. The COSSAC organization was a planning staff which existed from 1943 to 1944. Prior to the identification of General Eisenhower as the Supreme Allied Commander of forces in Europe, the plans staff focused on potential courses of action for the invasion of continental Europe. Operation Overload was the chosen name for the overall air, sea, and land based operation.

[67] Harrison, *Cross Channel Attack*, 71.

The Allies saw three potential targets serving as amphibious landing zones with Calais, Brittany, and Normandy. Calais was not only the closest distance from England, but it also proved to be a potential threat to any German elements operating in Normandy and Brittany. However, with the competing German interpretation of Allied landing locations, the preponderance of German armored formations, to include the strategic coastal reserve, resided in that area. The presence of armored formations made that an unattractive option for Allied planners. Next, the allied forces looked at the option of Brittany due to the numerous ports available for the offload of Allied equipment and personnel. However, this option provided very few usable beachheads to mass forces at multiple locations, and the added risk of an extended sea line of communication supporting movement to the landing site and follow-on logistical operations. That left the best option being Normandy.[68]

[68] COSSAC Planning Document: *Digest of Operation Overlord*, 2.

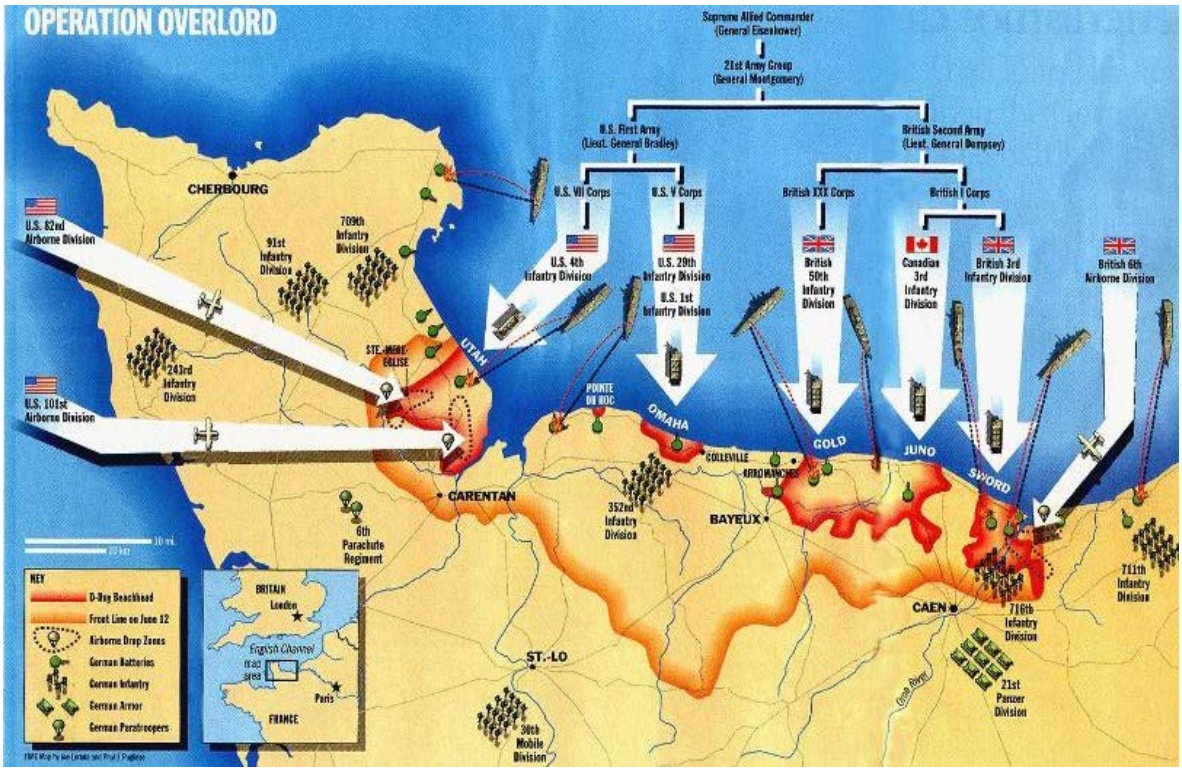


Figure 2. Operation Overlord. "Where in the World War? Mapping the Geography of D-Day," Learn: Teachers & Students (New Orleans, LA: The National World War II Museum, 2017), accessed on March 9, 2017, http://www.nationalww2museum.org/learn/education/for-teachers/lesson-plans/where-in-the-world-war.html.

The goal for airborne operations in Normandy was to provide a disruption effort in order to allow for the amphibious assault forces to secure their lodgment and project combat power forward of the English Channel prior to breakout operations.[69] The airborne force needed to provide multiple dilemmas to the enemy command in an effort to retard his ability to make sound decisions on the positioning of combat power. It was extremely necessary to either slow the movement or completely divert enemy armor capabilities.

Planners for the airborne operation identified the location of enemy armor assets of significant concern. The risk of armored forces against the dismounted and vulnerable airborne forces cannot be understated. Airborne forces landed behind enemy lines with a limited amount of

[69] Ibid., 1. "The object of Operation 'OVERLORD' is to mount and carry out an operation, with forces and equipment established in the UNITED KINGDOM, and with target date 1st May, 1944, to secure a lodgment on the Continent from which further offensive operations can be developed."

supplies, to include ammunition, and the total number of Anti-Tank (AT) weapon systems was severely limited. In fact the anti-tank weapons system allocation for an entire airborne infantry regiment consisted of a mere seventy-seven weapon systems, which works out to be only two anti-tank weapons per platoon.[70] Overall, this was a significant increase from the zero AT weapons systems authorized as part of the October 15, 1942 Table of Organization (TO).[71]

The US airborne forces carried the American M1 2.36 inch 'Bazooka' weapon system. Unfortunately, this anti-armor system penetrated a mere inch of the overall four inch thickness of the Tiger tank. This left the airborne forces vulnerable to the shock, firepower, and mobility of the Tiger tank and its eight-eight millimeter main gun. General Gavin, when preparing for the Normandy invasion, stated "Give us anything that will stop the German Tiger tank, as a counterattack by them is the first thing that will hit us after we jump."[72] However, these limitations were mitigated to an extent by the aforementioned deception plan, a forceful tempo through improvements in assembly operations, the choice to conduct the mission during hours of limited visibility, and the active encouragement of partisans to disrupt German movements.[73]

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[70] US War Department. *Table of Organization No. 71, Airborne Division, Change 2* (Washington, DC: Government Printing Office, February 24, 1944), 2-3. The number of AT systems in a Parachute Infantry Regiment increased from zero in the original *Airborne Division Table of Organization* in 1942 to seventy-three in as indication in the *Airborne Division Table of Organization* in 1944. The number of AT systems within a Glider Infantry Regiment went from zero to eighty-one. The additional allocation of weapon systems were the direct result of engaging armored formations during previous airborne operations. This is clear evidence of adaptability and the necessity to evolve tactics, techniques, procedures, and equipment while still engaging in combat operations.

[71] US War Department. *Table of Organization No. 71, Airborne Division* (October 15, 1942), 2-3.

[72] Hoyt, *Airborne*, 49.

[73] SHAEF Planning Document, *Conditions in Normandy* (Abilene, KS: Eisenhower Presidential Library, June 3, 1944), 2, accessed on January 24, 2017, http://www.eisenhower.archives.gov/research/online_documents/d_day/1944_06_03_Conditons_in_Normandy.pdf. According to official correspondence to General Eisenhower in an operational updated on the morning of June 3, 1944, the French resistance forces played a key role in aiding the successful airborne landings. The resistance forces provided serval disruption efforts, such as cutting telephone lines and disabling rail networks, which assisted in confusing and slowing German forces. Although, the Allied forces had direct means of contacting the Resistance Groups, Charles DeGaulle and his committee were the single approval authority for the employment of resistance forces.

Some questions were raised by senior officers regarding the effectiveness of airborne forces and the need for a division-sized element for combat operations. General Eisenhower, in a letter to General Marshall on September 20, 1943, stated, "I do not believe in the airborne division."[74] General Marshall, on the other hand, favored the use of airborne forces. He believed that the disruption effect of a deep strike with airborne force would take significant pressure off of the coastal defenses and therefore allow an amphibious landing with fewer troops. General Marshall also faced the fact that the US Army was competing for amphibious vessel allocation with units operating in the Pacific theatre. The airborne operations created an opportunity to enable the amphibious landing.[75]

General Eisenhower's sentiments for airborne operations eventually changed to accept the positive effects of employing airborne forces. Several subordinates who used airborne elements in previous operations voiced their opinions on the matter. Ground force commanders, such as General Patton, who operated with the support of airborne forces in Sicily, felt that the airborne mission proved essential in supporting his amphibious landing. Additionally, during the planning sessions for the Normandy operation, General Omar Bradley told General Gavin that he would not make the amphibious landing without being certain the parachute assault troops would go in first and delay German reinforcements' access to the beachheads.[76]

It was important to identify the correct objectives for airborne assault. In order to accomplish this complex task, the airborne units first needed to understand where the main amphibious assault would be landing. The highly complex terrain would ultimately limit the area for assault objectives inland. The airborne assault objectives would serve two purposes. First, they would allow for friendly force freedom of maneuver when moving off the beachheads. German

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[74] Gavin, *On to Berlin*, 53.

[75] Hoyt, *Airborne*, 48.

[76] Gavin, *On to Berlin*, 53.

forces identified the road networks as key terrain and flooded many of the marches inland in an attempt to create obstacles for maneuver forces. This action by German forces effectively canalized mechanized platforms to the improved road networks.[77] This required the control of key towns and causeways which would serve as critical avenues of approach. Similarly, the enemy saw value in similar pieces of key terrain. These objectives provided the enemy commander with the ability to re-enforce the beachhead and keep friendly forces from fully securing the lodgment.

VII Corps, the element responsible for landing on Utah Beach and capturing the port of Cherbourg, assumed Tactical Control (TACON) of the two airborne divisions.[78] The planners divided the airborne operation into two separate missions. The first mission oriented one division, the 101st Airborne Division, on the immediate seizure of towns and German fortifications immediately behind the landing zones for Utah beach. The second mission, eventually assumed by the 82nd Airborne Division, was much further inland and would facilitate a Forward Passage of Lines (FPOL) for a division from the amphibious assault force to seize Cherbourg. In theory, the concept attempted to target the enemy in depth and increase the complexity for the German commanders. However, it also assumed additional risk in leaving an entire division's worth of combat power almost thirty kilometers from the amphibious assault landing zone with only aerial resupply as a method of sustainment.[79] The 82nd airborne was earmarked for the second mission because of their previous combat experience in Sicily and Italy.

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[77] Ibid., 88. In early December of 1943, General Bradley advised the airborne planners that several areas along the Normandy coastline were being flooded according to aerial reconnaissance photographs. This provided an important indicator for the airborne plans team. First, this was an indication that armor was not likely to be employed in this part of the country. Therefore, an economy of force mission would suffice for German commanders. Secondly, this indicated that German planners did not intent to fight an offensive engagement in this area. Otherwise, the tactical obstacles chosen would enable mechanized maneuver and provide better conditions to support engagement area development.

[78] Hoyt, *Airborne,* 51. The term TACON is associated with a maneuver element that is placed under the tactical control of the parent unit. VII Corps in this instance, did not have authority to change the force composition of the airborne divisions. However, they did have a role in identifying the tactical objectives forward of the amphibious landing areas.

[79] HQ, 82nd ABN DIV, *Order Number: 6-3244-1: Operation – "Neptune" Airborne Troops*, 14 May 1944, 1. Prior to the operation being amended by the repositioning of the German 91st Infantry Regiment, the

The airborne mission eventually assigned to the 82nd Airborne Division was titled Objective Boston.[80] The initial concept emplaced airborne forces significantly to the rear of Utah Beach, which allowed for additional disruption of German forces operating to the north on the Cotentin Peninsula. Similar to the German concept used to isolate the Jutland Peninsula in Denmark, planners placed the airborne forces where they could seal off the Germans occupying the peninsula, and subsequently send mechanized forces to destroy any remaining enemy resistance. This action established conditions to seize the port at Cherbourg.[81] One of the substantial drawbacks to conducting the amphibious assault in Normandy was the lack of significant harbors to offload equipment. The capture of the port at Cherbourg increased the flow of personnel and equipment and decreased the reliance on the artificial Mulberry harbors at Arromanches-les-Bains.[82]

The question then came to the exact positioning of airborne objectives. The 82nd Airborne Division planned to insert into the area around St.-Sauveur-le-Vicomte. In February of 1944, the division planners called for all three regiments in a triangular formation just west of the village. The airborne divisions acquired an additional infantry regiment each for the airborne operation. The airborne commanders had concerns about the ability to self-sustain and defend inland objectives for extended periods of time. The triangular division concept pursued by Infantry School commandant,

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Operation Neptune Field Order Number 6 described the mission of the airborne elements as, "82nd A/B Div and 101st A/B Div covering the landing of the seaborne assault, captures CHERBOURG with the least practicable delay. The 101st A/B Div landing by parachute and glider between STE. MERE-EGLISE (349965) and CARENTAN will assault the Western exits of the causeways to assist the landing of the seaborne troops and will cover the crossings of the DOUVE from the junction of the MERDERET to the sea. The 4th Div leading the seaborne troops attacks to the Northwest passing through the Airborne Divisions."

[80] Steven J. Zaloga, *D-Day 1944 (2): Utah Beach & the US Airborne Landings* (Oxford, England: Osprey Publishing, 2004), 35.

[81] Ibid., 81-82.

[82] Gregory Pique, *Arromanches: History of a Harbor* (Bayeux, France: Orep Editions, 2004), 2-3. The artificial harbors would serve as the primary logistical hub for reinforcements, equipment, food, and other necessary war materials for the Normandy invasion. The harbor at Arromanches was a British innovation that used the existing terrain in conjunction with man-made structures brought over from England to support continuous operations.

Colonel George C. Marshall, significantly increased the mobility and firepower over the favored squared division, but the additional infantry regiments within the airborne division would ensure overmatch against dismounted forces in the defense.[83]

The 507th Parachute Infantry Regiment would land farthest to the north and be responsible for initial assault objectives to the west and north of the village moving towards the Douve River. The 508th Parachute Infantry Regiment would be responsible for objectives to the southwest of their drop zone moving towards the village of Portbail. Finally, the 505th Parachute Regiment would serve as the main effort for the division and secure St.-Sauveur-le-Vicomte.[84] The 505th was the only regiment in the division to conduct two combat jumps in Sicily and Italy, and was therefore responsible for the securing the assault objective deemed most rigorous. The drop zones would be identified as N, O, and T.

The second U.S. airborne mission was identified as Objective Albany.[85] The planners identified three different drop zones for the 101st Airborne Division: A, C, and D. This operation placed airborne personnel directly southwest of the amphibious force landing at Utah Beach. The 101st Airborne mission planned to block movement of German reserves, seize the western ends of the causeway from Utah Beach, and secure river crossing over the Merderet River.[86] This provided additional protection of the eastern flank of Utah Beach. With the initial assault objectives secured,

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[83] Dan C. Fullerton, *Bright Prospects, Bleak Realities: The US Army's Interwar Modernization Program for the Coming of the Second World War* (Lawrence, KS: University of Kansas, December 7, 2006), 142, 145, 147. The triangular division provided several advantages over the previous squared divisions. The most significant benefits included an enhancement in mobility, increase in mechanization, less augmentation, and an overall increase in firepower. Although the standard infantry divisions would receive the 105 millimeter artillery pieces, the airborne divisions were limited to the seventy-five millimeter pack howitzers as the artillery compliment and the fifty-seven millimeter AT weapons delivered through glider-borne operations.

[84] Gavin, *On to Berlin*, 89-90.

[85] Zaloga, *D-Day 1944 (2)*, 29.

[86] Ryan, *The Longest Day*, 135. The 101st airborne division would secure the remaining four causeways, bridges over the Douve River and Carentan Canal, and a critical artillery battery at St.-Martin-de-Varreville. The artillery position was capable of providing indirect fires on the Utah beach landing sites and therefore disrupt the landing force.

regiments from the 101st Airborne Division planned to link up with units from the 82nd Airborne Division and completely seal off the Cotentin Peninsula.[87]

The German commanders, simultaneous to the Allied planning staffs, conducted their own assessment of the coastal defense, and the German Oberkommando des Heeres (OKH) decided to move the 91st Infantry Division to the vicinity of St.-Sauveur-le-Vicomte. This created a significant issue for the airborne planners in the terms of acceptable risk. In an effort to avoid dropping an entire division of paratroopers amidst a reinforced German mechanized division, the COSSAC planning staff and the 82nd Airborne command team decided to move the drop zones approximately seventeen kilometers to the east to the vicinity of Ste.-Mere-Eglise.[88]

The change in the drop plan for the 82nd Airborne Division was conducted just five days before the airborne assault was scheduled. This created significant challenges in alerting pathfinder teams, aircrews, jumpmasters, and ground force commanders responsible for the employment of the force once on the ground. The entire scheme of maneuver from drop zones to the primary assault objectives needed reassessment. Fortunately, the 82nd Airborne Division capitalized on the Intelligence Preparation of the Battlefield (IPB) conducted by the staff of the 101st Airborne Division. Therefore, the increased risk for the Army Air Force and the 82nd Airborne Division was mitigated due to a wealth of knowledge of the terrain and enemy defenses in the vicinity of Ste.-Mere-Eglise.[89] The movement of the drop zones decreased the amount of risk assumed from German forces, but it also had the added benefit of decreasing the mutually supporting distance between the two US airborne divisions. The 82nd and the 101st transitioned from having eighteen kilometers of separation with the initial plan to just over eight kilometers between the two divisions with the new modifications.

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[87] Tugwell, *Airborne to Battle*, 204.

[88] Gavin, *On to Berlin*, 94,97.

[89] Hoyt, *Airborne*, 50.

This operation secured terrain from St Martin de-Varreville to La Barquette, just north of Carentan. The 101st Airborne Division served originally as the only airborne division in direct support of the Utah Beach landings and would be the first ground forces to make contact with the amphibious assault force, but they would now share that responsibility with the 82nd Airborne Division. Additionally, the 101st Airborne Division gave the western portion of the Merderet River crossing seizure to the 82nd Airborne Division.[90]

[90] Zaloga, *D-Day 1944 (2)*, 29.

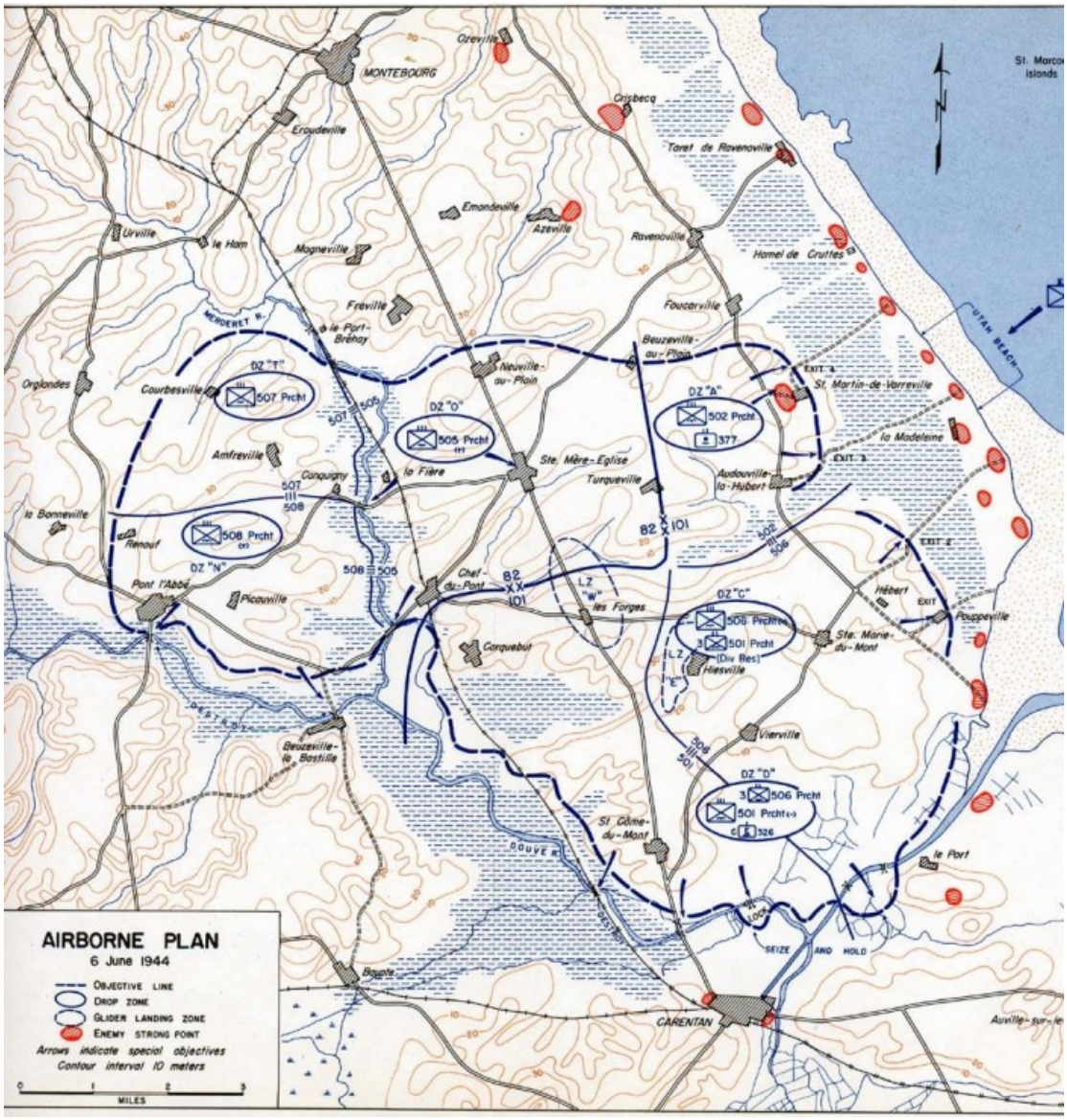


Figure 3. Airborne Drop Zones. "The American Airborne Assault," *Battle of Normandy Tours*, accessed on December 6, 2016, http://www.battleofnormandytours.com/american-airborne-assault.html.

The airborne divisions conducted further analysis on aircraft allocation and feasibility of moving the two divisions to their assigned DZs. The assessment concluded that the divisions needed two lifts to bring all of the combat power across the channel due to the limited number of aircraft. The paratroopers would be the first friendly elements on the ground in Normandy. The Army Air Force and the British Royal Air Force allocated 378 C-47 transports for the 6,420

paratroopers of 82nd Airborne Division, while the 101st Airborne Division would receive 433 C-47 aircraft for their 6,928 troopers.[91] The C-47 transport held anywhere from 18-20 fully equipped paratroopers ready for combat. The glider force would arrive several hours later.[92]

The CG-4A Waco glider, which was towed by C-47 and bomber aircraft, carried the reminder of the forces from the 82nd and 101st to the fight. The glider carried thirteen fully equipped troopers to the battlefield, or it also had the option to serve in a resupply role.[93] Sustainment of the airborne force proved to be a significant planning consideration. According to the 82nd Airborne Division planning document used for Operation Neptune, each paratrooper carried one "K" and two "D" rations upon landing. The glider force provided additional sustainment relief until ground resupply was facilitated with the amphibious landing force.[94]

The airborne planners needed to make a decision on the Priority of Air Land (POAL) equipment for the glider operations. The CG-4A was capable of carrying 3,750 pounds, which limited the combination of personnel and equipment brought forward on resupply operations. The Waco glider could carry two men and a fifty-seven millimeter AT gun, either a seventy-five millimeter pack Howitzer, or a jeep. This forced the ground force command to prioritize which types of weapon system were required in space and time to increase firepower, mobility, and survivability.[95]

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[91] Gavin, *Airborne Warfare*, 56, 63.

[92] Zaloga, *D-Day 1944 (2)*, 40.

[93] Air Mobility Command Museum, *Aircraft: CG-4A* (Dover, Delaware: 1999-2016), accessed December 8, 2016, http://amcmuseum.org/at-the-museum/aircraft/cg-4a/. "The WACO CG-4A Glider was the most widely used troop/cargo glider of World War II. Considered to be very suitable as a troop/cargo glider, the CG-4A could carry thirteen troops, or cargo loads that could include a Jeep with a crew of four plus equipment, or a seventy-five millimeter howitzer with its gun crew of three, ammunition, and supplies."

[94] 82nd Airborne Planning Document: *Operation – Neptune: Airborne Troops* (Fort Leavenworth, KS: Combined Arms Research Library, May 12, 1944), 6.

[95] Gavin, *Airborne Warfare*, 146. The British Horsa model glider provided the airborne planners with a significant increase in capability over the Waco CG-4A. The Horsa was capable of moving 6,700 pounds and could carry an AT gun or an artillery piece and a jeep.

The Troop Carrier section of the Army Air Force planned their landing zones offset from the drop zones. The securing of drop zones for the follow-on glider formations became a critical task for the paratroopers who arrived on the night of June 5, 1944. The glider formations planned an offset landing due to the limited number of landing zones available in the region. The complex hedgerow system also created a significant number of fields saturated with poplar trees and 'Rommel's Asparagus.'[96] The impact of these tactical obstacles was significant, consisting of eight foot poles stuck in the ground approximately one hundred feet apart, and then strung together with barbed wire and anti-personnel mines while covered by machine gun emplacements. The German forces thereby created an engagement area capable of stopping glider landings, but also disrupting parachute forces once on the ground with interlocking fields of machine gun fire.[97]

Planners later admitted to underestimating the hedgerow system's impact on tempo and clearance operations, but it did play a significant role in the planning of landing zones. In subsequent fighting, the hedgerow system created a significant number of tactical obstacles for the ground maneuver elements. Instead of rapid maneuver between tactical objectives, ground forces treated every series of hedgerows as though they held an enemy force in a deliberate defense. [98]

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[96] LTC R.P. Carr, *Troop Carrier Planning for Operation Neptune, England Feb-Jun 1944, Cross Channel Invasion of Europe: Personal Experiences of a Troop Carrier Wing Representative on the Planning Staff* (Fort Leavenworth, KS: Command and Staff College, School of Combined Arms Regular Course, 1946-1947), 3.

[97] Hoyt, *Airborne*, 51.

[98] Michael D. Doubler, *Busting the Bocage: American Combined Arms Operations in France, 6 June – 31 July 1944* (Fort Leavenworth, KS: US Army Command and General Staff College, 1955), 17. The term bocage is of Norman origin describing terrain that is a mixture of dense woodland and pasture. The bocage presented an unforeseen obstacle to allied efforts in the expansion the lodgment and continued offensive operations. The bocage is often found on the edge of a field or enclosing an area of farmland. Several centuries of growth created a highly vegetated wall of approximately two to three feet in width and five to six feet in height.

## US Airborne Forces in Action

The parachute assault was originally scheduled for June 5, 1944. However, weather played a critical role in the airborne landings as well as the amphibious assault. The wind speed and the rainfall provided critical planning factors for General Eisenhower and his approval for the operation.[99] Airborne operations favor wind speeds under fifteen knots or else there is a significant risk of injury for personnel and possible scattering of equipment.[100] As a result, the airborne operation and amphibious assault were postponed until twenty-four hours later.[101]

D-Day was set for the June 6, 1944, with the airborne assault to take place in the early morning hours.[102] The airborne forces were the first to land in occupied France, and they expected to conduct operations without support for up to several days. Operational surprise remained an important aspect of the airborne assault, so the aircrews flying the C-47 transport aircraft approached the objectives without overflying the targets. This provided two distinct advantages contributing to operational surprise. First, the transport aircraft passed around the Normandy Peninsula and flew far west of the amphibious assault forces in order to prevent the early warning of German ground forces. Secondly, the approach avoided flak from the coastal guns and artillery pieces. The only downside was that it required additional flight time over German-occupied France.

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[99] *Conditions in Normandy*, 2. In a telegram to General Eisenhower on the morning of the June 3, 1944, the SHAEF headquarters wrote, "Success or failure might easily hinge upon the effectiveness, for example, of the airborne operations. If the weather is suitable for everything else, but unsuitable for airborne operations, the question becomes whether to risk the airborne movement anyway or to defer the whole affair in the hopes of getting weather that is a bit better."

[100] Tugwell, *Airborne to Battle*, 23. Airborne operations with wind speeds in excess of 25 knots almost always end in severe injury of personnel.

[101] Hoyt, *Airborne*, 51.

[102] Joint Publication (JP) 3-02, *Amphibious Operations* (Washington, DC: Government Printing Office, July 2014), III-10. D-Day describes the unnamed day on which a particular operation commences or is to commence. D-Day reflects the target date for the amphibious landing, so the airborne operations component of the Normandy invasion actually took place on D-1, 5 June 1944.

This left the aircraft vulnerable to enemy engagement and placed additional stress on the navigation skills required of aircrews and jumpmaster teams. [103]

The introduction of pathfinder teams placed just enough combat power on the ground to confuse the enemy. Although there were only 570 paratroopers on the ground an hour before the main body made its assault, the confusion on the battlefield led to inaccurate reporting and paralysis in decision-making. Even the commander of the German 711th Division, Major General Josef Reichert, witnessed two British paratroopers land in front of his division headquarters. Despite this close encounter with the enemy, General Reichert was still uncertain whether the airborne forces were merely part of a strategic raid on his headquarters or a shaping operation for expected Allied invasion force. [104]

The weather conditions played an important role in the visibility for aircraft and the resulting drop pattern. The level of cloud cover caused a significant number of the aircraft to lose contact with their formation leaders, which affected the ability for the aircraft to drop the paratroopers on their intended drop zones.[105] The actual drop dispersion pattern showed that only thirty-three percent of the assault force landed on their appropriate drop zone. Only one regiment, the 505th PIR, landed on their planned drop zone, which was mostly due to inclement weather and a short time window, approximately one hour, given to the majority of the pathfinder teams once on

[103] Gavin, *Airborne Warfare*, 54-55. The troop carrier flight plan presented many challenges for Allied forces. The mission required significant amounts of detailed planning to ensure simultaneity and the delivery of airborne forces along multiple objectives over a period of six hours. The aircrews used reference points and lighting over England to support formation flying before negotiating the cross channel movement and overflight of France.

[104] Ryan, *The Longest Day*, 113, 116. The 570 paratroopers inserted just after midnight on June 6, 1944, denotes the total number of Allied paratroopers (US and British) that worked toward marking the drop zones for the main body.

[105] Zaloga, *D-Day 1944 (2*), 28.

the ground. [106] Despite the actual landings, the aircraft were able to penetrate coastal defenses and deliver the majority of the paratroopers to the fight. The Supreme Headquarters Allied Expeditionary Force (SHAEF) estimated on June 6, 1944, that out of 1,250 total Allied planes, 833 of those representing the US airborne missions, designated to drop personnel and equipment, only thirty were unable to complete their mission.[107]

Approximately sixty percent of all the equipment was lost was lost upon exit from the C-47 aircraft. This included vital pieces of equipment such as leg bags with individual weapons and sustainment items, radios, mortars, and ammunition.[108] Several different types of door bundles were also used as an attempt to supplement the glider and amphibious force resupply plan. Unfortunately, a significant portion of these items were lost in the flooded portions adjacent to the planned drop zones. [109] Despite this fact, the paratroopers made do with the equipment they possessed and continued to move to their assigned objectives.

The 101st Airborne Division was the first United States airborne unit to land in occupied-France. The majority of the force landed at 0130 on June 6. The 101st quickly seized the towns of Poupeville and Ste-Martin-de-Varreville just south of Utah Beach.[110] The decentralized manner in which personnel were dropped slowed the assembly process, but the unit leadership trained in

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[106] Ryan, *The Longest Day*, 135. The 505th PIR was the only regiment during D-Day to land at the correct time and on the correct drop zone. Their accomplishment earned them the official moto of "H-Minus."

[107] Dwight D. Eisenhower to George C. Marshall, *SHAEF Command Post, Personal From General Eisenhower to General Marshall for His Eyes Only* (Abilene, KS: Eisenhower Presidential Library, June 6, 1944), 1, accessed on 24 January 2017, http://www.eisenhower.archives.gov/research/online_documents/d_day/1944_06_06_DDE_to_Marshall.pdf. "All preliminary reports are satisfactory. Airborne formations apparently landed in good order with losses out of approximately 1250 airplanes participating about thirty."

[108] Ryan, *The Longest Day*, 135.

[109] Tugwell, *Airborne to Battle*, 212.

[110] Ibid., 213.

establishing little groups of paratroopers (LGOP). Therefore, although initial assault objectives were quickly seized, they were often accomplished by platoon-sized elements or smaller. Unexpected German forces in Ste-Come-du-Mont proved to be the biggest challenge for the 101st Airborne, but the objective was still seized accordingly.

The 82nd Airborne Division landed at 0230, approximately one hour after the 101st Airborne Division, and faced similar challenges in their assembly plan.[111] Elements from the 505th PIR moved to secure the crossing points over the Meredret River, specifically at La Fiere Bridge and the crossing point at Chef-du-Pont. Although the German forces were denied access to the beachheads, the crossing points were contested for several days. The German 91st Luftlande-Division, amidst the loss of their division commander, was unsuccessful in counterattacking several times into the town of Ste-Mere-Eglise.[112] The La Fiere causeway was finally captured on June 9 (D+3).

Clearing the landing zones for the glider forces was an important task for the airborne forces. This critical requirement generated the need for airborne engineer detachments with specialized skills and equipment to ensure the best possible conditions for safe glider landings. The landing zones for the 82nd Airborne involved small direct fire exchanges, but overall the enemy resistance was negligible.[113] Even with secured LZs, the glider landings also had their share of issues. The Waco gliders were fully loaded and several of the airframes experienced collisions while competing for landing space. The poor glider landings were also a result of the soft ground and the nature of the heavy gliders loaded with equipment and even armored plating in some

[111] Steven J. Zaloga, *D-Day 1944 (2)*, 9.

[112] Antony Beevor, *D-Day: The Battle for Normandy* (New York, NY: Penguin Books, 2009), 66.

[113] Ibid., 70.

instances. The glider units from the 101st arrived at 0400.[114] They secured the western ends of the causeways coming off of Utah beach as well as bridges over the Douve River. The 82nd Airborne glider force arrived just seven minutes later. Although, the glider force brought additional sustainment items to support the airborne divisions on June 6, the preponderance of sustainment assets came through aerial resupply for the remainder of the operation. [115]

By the end of D+1, June 7, 1944, the 4th Infantry Division conducted link-up with both airborne divisions and established a six miles deep beachhead for the logistical lodgment area.[116] Overall, the airborne operations seized all of their assigned objectives; however, it did take several weeks to seek out all of the German pockets of resistance and secure the entire Cotentin Peninsula.[117] Cherbourg, the immediate objective for the amphibious assault force, was seized on June 27, 1944 and marked the successful completion of operation Neptune. [118]

## Part V: Operational Art and Airborne Forces in Normandy

Achieving operational surprise served as one of the defining components leading to success of the airborne operations on June 6, 1944. The German commanders possessed the capability to defeat the airborne elements; however, three enemy factors prevented German forces from stifling the Allied forces and aided in the achievement of operational surprise. First, the disposition of German forces isolated the majority of the panzer reserves on the West side of the Caen Canal and the Orne River. Secondly, the convoluted command structure among Field Marshal Rommel, Field

[114] Zaloga, *D-Day 1944 (2)*, 9.

[115] Tugwell, 213, 215.

[116] Tugwell, 215.

[117] Gavin, *On to Berlin*, 120. General Ridgway in a report to Eisenhower on the 82nd's performance on July 25 1944, "Landing during darkness beginning at H-4 hours on D-Day, this division participated in the initial operations of the invasion of WESTERN EUROPE for thirty-three continuous days without relief and without replacements. It accomplished every assigned mission on or ahead of the time ordered."

[118] Tugwell, *Airborne to Battle*, 215.

Marshal von Rundstedt, and Hitler prevented clear release authority for the employment of reserve forces. Essentially, the entire panzer element waited idly as the airborne forces achieved their objectives. This provided enough time for the 2nd Armored Division to come ashore and link-up with the airborne elements. Finally, the uncertainty created through a limited visibility airborne assault led to stifled German initiative. German commanders were receiving reports from almost everywhere on the battlefield. Often, reports directly contradicted each other and the ensuing confusion led to German leadership paralysis.[119]

US airborne forces achieved surprise at the tactical as well as the strategic levels. The tactical level of surprise came through the delivery method of the paratroopers. The use of glider and parachute assault allowed the forces to descend on their objectives without being heard or seen. The strategic level of surprise came through the tempo and strategic mobility that aircraft gave the attacking force. The integration of aircraft allowed the airborne force to travel almost 200 kilometers in just under two hours. The use of aircraft also allowed the airborne commanders the opportunity to land their forces where the enemy least expected, while avoiding tactical obstacles integrated into the defensive plan.[120]

Additionally, the carefully-designed deception plan directly attributed to the success in achieving surprise. The key component to any successful deception plan is the correct use of resources. The enemy commander must believe that the deception action presents a credible threat in order for the plan to be successful. The Allies made several separate parachute drops with dummy paratroopers. One drop took place between Le Havre and Rouen, and a second operation dropped dummy paratroopers southeast of Isigny. The deception operation was so successful that German commanders reported airborne landings in near Cabourg and Lessay, a French town nearly twenty-five miles from any planned landing zones. The dummy paratrooper employment, along

[119] Ryan, *The Longest Day*, 146-147.

[120] Tugwell, *Airborne to Battle*, 63.

with Patton's First US Army Group deception operation across from the Pas-de-Calais helped set the conditions to strike at a time and place where the enemy least expected.[121]

The Normandy airborne operation also integrated the operational design concepts of simultaneity and synchronization into the operation. The simultaneous drop of personnel on six different regimental-sized drop zones was critical in overwhelming the enemy. The integration of the Army Air Force and British partners during the planning process made this accomplishment possible. The airborne operation had several layers of complexity, but the interoperability allowed for flexibility once underway and a high level of shared understanding. The parallel planning with coalition forces allowed for aircraft to take off, organize in flight, and drop personnel within a two hour time window which overwhelmed the enemy commander's ability to make rational decisions.

The integration of artillery, airpower, the airborne assault, and the amphibious landings proved to be a critical aspect leading to success. The combined arms approach allowed the planners to overwhelm the enemy and increase the probability of success for the entire operation. This forced the enemy to look everywhere, despite the challenges of scarce resources, in order to find the true Allied disposition amidst the fog of war. The Allied aircraft were able to disrupt the enemy defenses with preparatory fires, which enabled a rapid amphibious landing so the 4th Infantry Division could conduct link-up with the airborne force.[122] Simultaneously, the airborne elements were providing the disruption effect along the causeways and severely restricted avenues of

[121] Ambrose, *D-Day*, 236. Rupert was the name given for the dummy parachutist models. The Germans in many instances thought the replicas were real paratroopers and diverted combat power and initiated false reports to their higher headquarters; Ryan, *The Longest Day*, 147-148. The dummy paratroopers created significant amounts of confusion for the German commanders. The dummies were dressed just like paratroopers, and each dummy was equipped with a string of firecrackers to give the illusion of an individual weapon system engaging the enemy.

[122] Harrison, *Cross-Channel Attack*, 76, 194-196. The pre-assault fires for the airborne and amphibious assaults were aimed at disrupting enemy airfield and transportation systems within the fighter range of Caen. Following the initial targeting, the air campaign shifted to the rail and road networks leading to the main battle area. The bombing was more effective on the areas around Utah Beach due to the sparse number of German forces and the thinner cloud cover than the area around Omaha Beach. Overall, only ten percent of the overall aerial bombardment was allocated toward coastal batteries and the beach defenses.

approach. The critical efforts to synchronize preparatory fires, airborne operations, and amphibious operations provided the necessary time-force phase deployment scheme and correct ratio of combat power to overwhelm the German forces and ensure operational success.

Tempo also played an integral role in the success of the airborne operations. Maintaining a high operational tempo in terms of the volume of paratroopers brought to the fight within the first two hours aided in gaining the initiative. This is also the time when the operation is the most vulnerable to enemy exploitation and counter attack operations. The parachute forces from the entire assault force were all in France or en-route to their respective objectives by 0230 on June 6th.[123] This displayed massive success in terms of level of difficulty in synchronizing 1,250 aircraft in time and space. Additionally, an in-depth understanding of the terrain provided the opportunity for forces to orient upon landing. Overall, only fifty percent of the pathfinder forces landed on their objectives and provided the radio signal needed to vector in the transport aircraft appropriately, but the forces still enabled follow-on echelons to secure objectives which denied tempo and access to German reserve forces.[124]

Finally, airborne operations are inherently risky. They are rich with both accidental and tactical risk for the commander to assess. The defining feature to the risk in the Normandy operation was the willingness to exchange the violent seizure of key terrain with the risk of losing a large portion of the force to armored units and strongpoint defenses. Air Chief Marshal Sir Trafford Leigh-Mallory, Commander-in Chief of the Allied Expeditionary Air Force, approached Eisenhower on May 20, 1944 in an effort to cancel the airborne operations in Normandy, because projected combat losses in the range of seventy percent of all glider aircraft and a fifty percent loss

[123] Zaloga, *D-Day 1944 (2)*, 9. The pathfinders from both airborne divisions began landing at 0015 on June 6, 1944. The 101st airborne division began landing forces at 0130, just one hour and fifteen minutes after inserting the pathfinder teams. Finally, at 0230, the 82nd Airborne Division began landing on its assigned drop zones.

[124] Gavin, *Airborne Warfare*, 56.

of the initial parachute forces.[125] Despite this appeal, senior commanders, such as General Bradley, agreed that the risk was worth the reward of having secured road networks and disrupted enemy forces.

## Part VI: Future Implications

The fundamental question now shifts to how airborne forces in the future will be able to identify accurate and meaningful objectives and sequence those objectives in time and space while preventing culmination. The arm of the airborne force is constrained by its ability to maneuver once on the ground. As General James Gavin stated, "An airborne assault, once it is under way, is beyond immediate relief, alteration of direction, or even succor. The battle, when finally joined, *is* the payoff."[126] Essentially, without the capability to move a force by vehicle, be it aircraft or a ground based platform, the unit will only be able to move at the speed of foot traffic.

Both in 1944 and 2017, a predominant issue remains in the ability to gain access to a contested area and ultimately seize the initiative from the opponent. This limits the airborne force to objectives of twenty kilometers or less per day due to the lack of vehicular transportation. In 1944, the airborne division was limited to the Willy's Jeep for mobility. The glider force for both airborne divisions was limited to just forty-seven Jeeps total. As a result, the division-level mobility was limited to key leader battlefield circulation and emergency resupply operations.[127] However, with

[125] Gavin, *On to Berlin*, 94. General Eisenhower, in his memoir *Crusade in Europe*, described how Air Chief Marshal Sir Trafford Leigh-Mallory tried to ensure the US airborne operation was never executed. Sir Leigh-Mallory described the airborne operation as, "a futile slaughter of two fine divisions" and "the combination of unsuitable landing grounds and anticipated resistance was too great a hazard to overcome." Instead, Sir Leigh-Mallory preferred for the aviation assets to go to the 6th British Airborne Division.

[126] Gavin, *Airborne Warfare*, 37.

[127] Zaloga, *D-Day 1944 (2)*, 44-45. Mission Chicago was the title for the glider operation supporting the 101st Airborne Division. Fifty-two Waco C-4A gliders carried 155 troops, sixteen fifty-seven millimeter anti-tank guns, and twenty-five Jeeps to the fight. Mission Detroit support the 82nd Airborne Division. Mission Detroit used forty-six Waco gliders to deliver 220 troops, twenty-two Jeeps and sixteen anti-tank guns.

the development of new platforms and capabilities, it is imperative to identify new ways to increase the flexibility of those forces already in the fight. For example, the development of light tactical vehicles can aid in enabling additional flexibility and increased tempo for airborne forces once on the ground. The Polaris MRZR All-Terrain Vehicle, fielded to the 82nd Airborne Division in 2016, is an example of an effort aimed toward achieving this goal.[128]

In the future, continued exploration into ground based platforms and rotary or fixed wing capability should be assessed. An airborne force, once on the ground, can greatly benefit from a fly-away mission capability. However, care needs to be given to the duration, distance, feasibility, and risk incurred once an airborne force is repositioned. Just as the operational planners for Normandy experienced, additional objectives will drive the amount of time and the ability to conduct resupply operations for those airborne forces moved to alternate objectives.

Resupply operations as part of a JFE continue to provide challenges for planning teams. Similar to the challenges seen in Normandy for airborne units with their aerial resupply dependence, the Army continues to look for solutions to prevent culmination during a forcible entry operation. The US Transportation Command (TRANSCOM) instituted a system in 2005 in order to ease the difficulty in establishing a base of operations. The new formation was designated the Joint Task Force-Port Opening (JTF-PO) element. Unlike the Normandy operation, JTF-PO element is designed to give a Combatant Commander (CCDR) the ability to open an Air Port of Debarkation (APOD) or a Sea Port of Debarkation (SPOD) whenever necessary. This capability is specifically employed in only permissive environments following a successful seizure of a port or airfield. These conditions imply that the first few days of the operation will still need to sustain with preponderance of efforts oriented on aerial resupply. Once a port or airfield is secured, this capability takes a significant amount of burden off of the ground force commander conducting the

[128] Joe Goult, "82nd Airborne Tries Ultralight Vehicle" http://www.defensenews.com/story/defense/policy-budget/policy/2015/04/22/us-armys-82nd-airborne-ultralight-vehicles-congress/26185911/

forcible entry mission, because the JTF-PO is a self-sustaining and mobile organization that is directly attached for operational support of a JFE mission.[129]

It is also essential to look at transitions in airborne operations much earlier when building an operational approach to gain access to a denied area by the way of a JFE. Transition points should be identified according to timed-phased line analysis looking in detail at the amount of time needed to self-sustain as well as the expected arrival time for follow-on forces. The enemy threat level and the use of terrain can help mitigate these factors, but branch plans need to be identified to prevent an airborne force from operationally culminating.

Tactical objectives chosen by the airborne commander become a form of adaptive planning similar to the emergent properties of a complex system.[130] The objectives are constantly refined throughout the planning process and they change as the enemy and friendly forces engage in the process of attempting to achieve a relative advantage. The objectives chosen for the airborne assault must be clearly identified and planned, but they can also change drastically when the enemy modifies their disposition or scheme for defensive operations. Field Marshall Rommel, as the Army

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[129] Kenneth Walker, Alethia Reynolds, and Aviana Gutierrez, "Joint Task Force–Port Opening Comes to the Pacific," *Army Sustainment: Professional Bulletin of the United States Army Sustainment* January – Feb 2012(PB 700-12-01), accessed on January 24, 2017, http://www.almc.army.mil/alog/issues/JanFeb12/Joint_task_force_pacific.html. The US Transportation Command (TRANSCOM) is responsible for training, manning, and equipping the JTF-PO elements. "After the JTF–PO was successfully employed at air ports of debarkation (APODs), TRANSCOM examined using the new concept to fill the gaps in logistics support that existed at sea ports of debarkation (SPODs). The idea for the JTF–PO (SPOD) was developed in 2008 using the JTF–PO (APOD) as a model."

[130] Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity, A Platform for Designing Business Architecture* (Burlington, MA: Butterworth-Heinemann, 2006), 45-46. "Emergent, or type II, properties are the property of the whole, not the property of the parts, and cannot be deduced from properties of the parts. Emergent properties, by their nature, cannot be analyzed, they cannot be manipulated by analytical tools, and they do not yield to causal explanations." The airborne operations in the Normandy campaign derive from a discourse between the German and Allied commanders. The operational environment requires that planners constantly assess by means monitoring, evaluating, and making recommendations to commanders on refining objective locations; Lawrence Freedman, *Strategy: A History* (New York, NY: Oxford University Press, 2013), 555. The same dialogue associated with actions at the tactical level are also experienced when formulating strategy for the Normandy invasion. Specifically the dialogue between Roosevelt and Churchill in choosing southern Italy or northwest France as the point for establishing a foothold in continental Europe. Freedman describes strategy through the lens of Mintzberg. Mintzberg's conclusion was that "strategy formation walks on two feet, one deliberate, the other emergent."

Group B commander, influenced the development of anti-airborne tactical obstacles. He encouraged the placement of 'Rommel's asparagus', which denied access to key terrain for the airborne planners.[131] Fortunately, these tactical obstacles were identified through intelligence collection efforts, and the tactical objectives for the airborne units were modified. In future operations, it is critical that all forms of intelligence {Technical Intelligence (TECHINT), Signal Intelligence (SIGINT), Human Intelligence (HUMINT), Geological Intelligence (GEOINT), etc.} are leveraged to give the airborne commander the clearest picture of the enemy and terrain with respect to obstacle emplacement.[132]

Exceptional levels of shared understanding proved to be a significant contributing factor to the level of success in the airborne operations portion of Operation Overlord. Although the delivery of paratroopers to the battlefield was less than perfect, the individual paratrooper had the understanding of the mission objectives and the ability to adjust the assembly plan with minimal impact on mission accomplishment. Each of the units conducted sand table mock-ups of the objectives and rehearsed actions upon landing to the seizure of initial assault objectives down to the company level.[133]

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[131] Gavin, *On to Berlin*, 92.

[132] Army Doctrine Publication (ADRP) 2-0, *Intelligence* (Washington, DC: Government Printing Office, Aug 2012)), 4-3 - 4-9. The Army now has a wide array of intelligence capabilities that can provide added fidelity for airborne operations. Technical Intelligence (TECHINT) is, "derived from the collection, processing, analysis, and exploitation of data and information pertaining to foreign equipment and materiel." Signals Intelligence (SIGNINT) is, "derived from communications, electronic, and foreign instrumentation signals." Human Intelligence (HUMINT) is "collection by a trained human intelligence collector of foreign information from people and multimedia to identify elements, intentions, composition, strength, dispositions, tactics, equipment, and capabilities." Geo-spatial Intelligence (GEOINT) is, "the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth." All of these tools can assist airborne planning teams in developing an accurate picture of enemy dispositions, compositions, and capability range as well as a detailed description of the terrain needed to conduct JFE operations.

[133] Gavin, *On to Berlin*, 90. Starting in February 1944, the infantry regiments supporting the airborne operation began familiarization with the possible objective locations and the terrain features around the objectives. Leaders needed to be able to identify their drop zone locations from the air, but also quickly focus combat power once on the ground. The inter-operability challenges between US and British ground and air force assets also presented opportunities for emergent doctrine. The creation of the manual, "Training Memorandum on the Employment of Airborne Forces" in late 1943 allowed for the creation of a common

Additional objectives beyond the ones identified for the initial assault should be examined whenever possible. In 1942, the manual for tactics and techniques for airborne troops recommended the following guidance for follow-on operations: "Attacks beyond the initial objectives should be coordinated. Generally they are initiated only on orders of the task force commander or his representative."[134] The issue becomes the balance of time available for planning and the level of certainty available beyond the initial entry operations. The operational artist in charge of developing ground maneuver plan should prepare additional objectives for the airborne force whenever possible. This will mitigate the friction during transition from seizure of initial assault objectives to the coordination and FPOL with follow-on forces.

Planning timelines also become a significant consideration as airborne operations continue to develop in the future. The airborne higher headquarters needs to be cognizant of their own use of time and ensure subordinate units the opportunity to conduct parallel planning. This improves the synchronization of the plan down to the individual paratrooper level. The airborne planners for Normandy had several months to plan, prepare, and execute their assigned mission. In modern times, elements of the 82nd Airborne Division are expected to assemble and be in flight in order to meet a global threat in just eighteen hours. This requires repetition in sequences among units preparing for out load operations and a familiarity with framework used to conduct Joint Forcible Entry.

Careful consideration should also be given to the Time-Phased Force Deployment Data (TPFDD) and POAL lists need to be rehearsed and given adequate attention in contemporary operations.[135] The airborne divisions in the Normandy campaign struggled with getting their AT

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language between the US and the British airborne units.

[134] US War Department, *FM 31-30*, 26.

[135] Janine Davidson, "The Contemporary Presidency: Civil-Military Friction and Presidential Decision Making: Explaining the Broken Dialogue," *Presidential Studies Quarterly*, (Mar 2013): 9, accessed November 30, 2016. The TPFDD needs to be accurate in terms of equipment to ensure feasibility of a plan. A senior level planner quoted the author stating, "Without a TPFDD, these things [planned combat operations]

(fifty-seven millimeter systems), artillery (seventy-five millimeter pack howitzer) and mobility assets (Jeeps) into the fight. Some of this was a result of poor landing zones, but it was also a conscious decision for leaders in prioritizing the equipment requested for each follow-on glider mission. As the 82nd Airborne continues to look at the Global Response Force (GRF) mission in the future the priority of equipment becomes an essential factor in saving time and frustrations on the ground.

## Conclusion

In the future, airborne operations will require more than the mere integration of elements of operational art. Although the elements of simplicity, synchronization, tempo, and risk mitigation procedures are important, the airborne community must continue to adapt, learn, and anticipate emerging enemy threats. The most effective airborne operations in the future will provide the greatest amount of flexibility in terms of strategic mobility in the air while ensuring tactical mobility and flexibility in terms of reacting to the fog and friction of combat on the ground.

The United States did not see airborne operations as a contingency in the overall continuity of warfare in 1939, but instead leveraged the capability and developed organizations as a result of the demonstrated capability seen in other foreign militaries.[136] The founding members of the US airborne community examined the importance of developing and integrating new doctrine and the refinement of techniques and procedures from the strategic to tactical levels. Evidence of this was illustrated when forces were able to adapt and execute disciplined initiative as a result of a clear commander's intent. These actions were exactly in line with the modern principles of mission

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are no better than grad-school research papers."

[136] John Lewis Gaddis, *The Landscape of History: How Historians Map the Past* (New York, NY: Oxford University Press, 2002), 30-31.

command.[137] The adaptability shown during mission execution ensured that the elements of surprise, simultaneity, and tempo were leveraged at the appropriate time and place. This was essential because of the risk of employment of German reserve forces and importance of seizing and retaining pieces of key terrain for the decisive operation. All of these efforts led to mission success for the airborne forces involved in Normandy.

The effective manning, training, and equipping of the US airborne community assisted in providing a specific set of capabilities required for conducting a cross-Channel JFE operation. This included the identification of specific missions for the airborne forces. As a result, the airborne forces employed in the Normandy campaign were able to provide the strategic mobility to set the conditions for the seizure of a lodgment and the defeat of German reinforcements attempting to deny access to northwest France. The Normandy campaign illustrated the importance of cooperation among the airborne forces, amphibious assault forces, and the air support elements. Success in future operations will depend on similar levels of interoperability and cooperation by all military branches of service in order to achieve mission success.

[137] ADRP 6-0, *Mission Command*, 4-1. There are six principles of mission command: build cohesive teams through mutual trust, create shared understanding, provide a clear commander's intent, exercise disciplined initiative, use mission orders, and accept prudent risk.

# Appendix 1

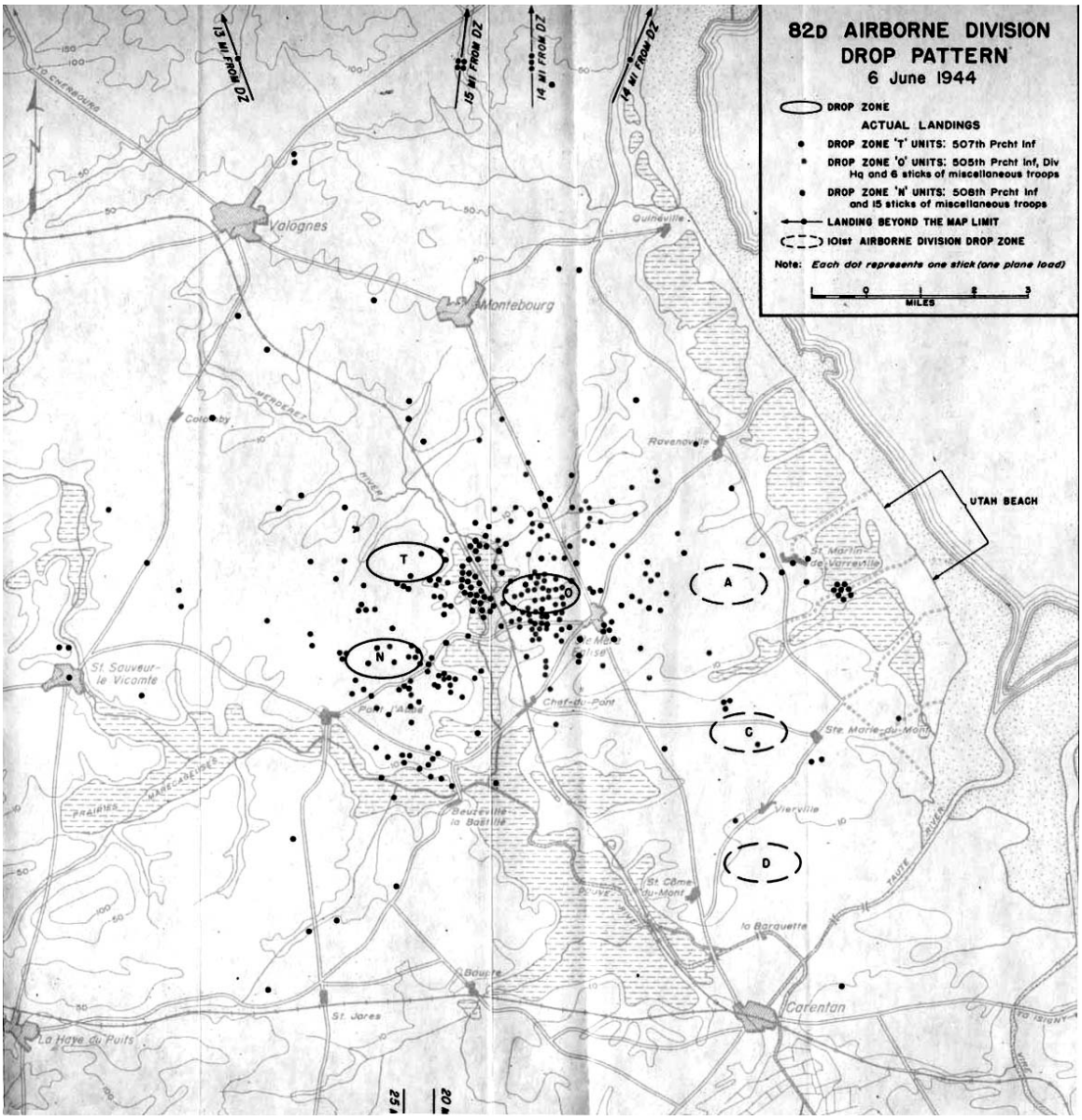



Figure 4. 82nd Airborne Division Drop Pattern as of June 6, 1944. United States Army, *Utah Beach to Cherbourg: 6 June – 27 June 1944* (Washington, DC: Center of Military History), xiii, accessed 16 December 2016, http://www.history.army.mil/books/wwii/utah/maps/MAP35.JPG.

# Appendix 2

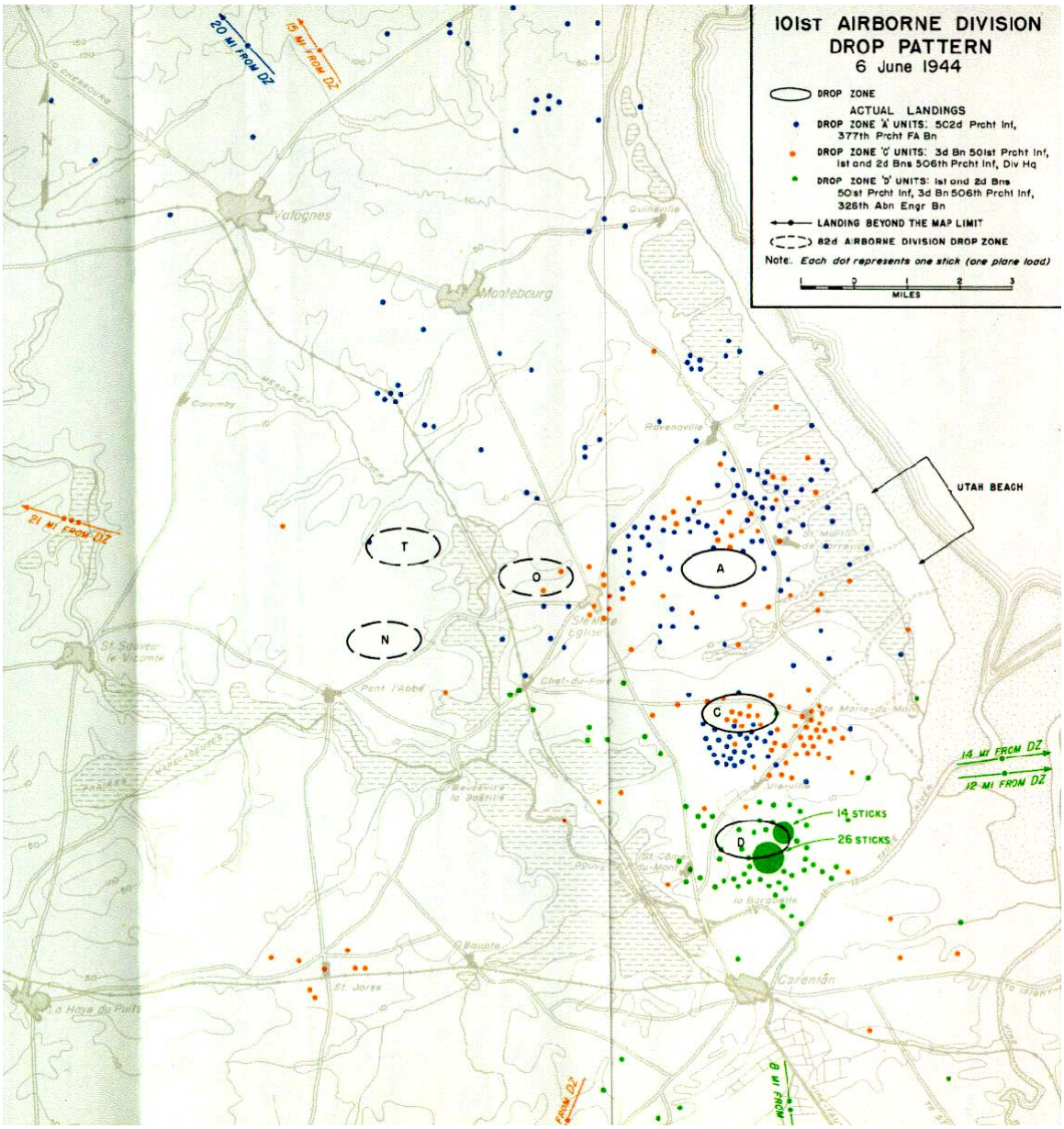
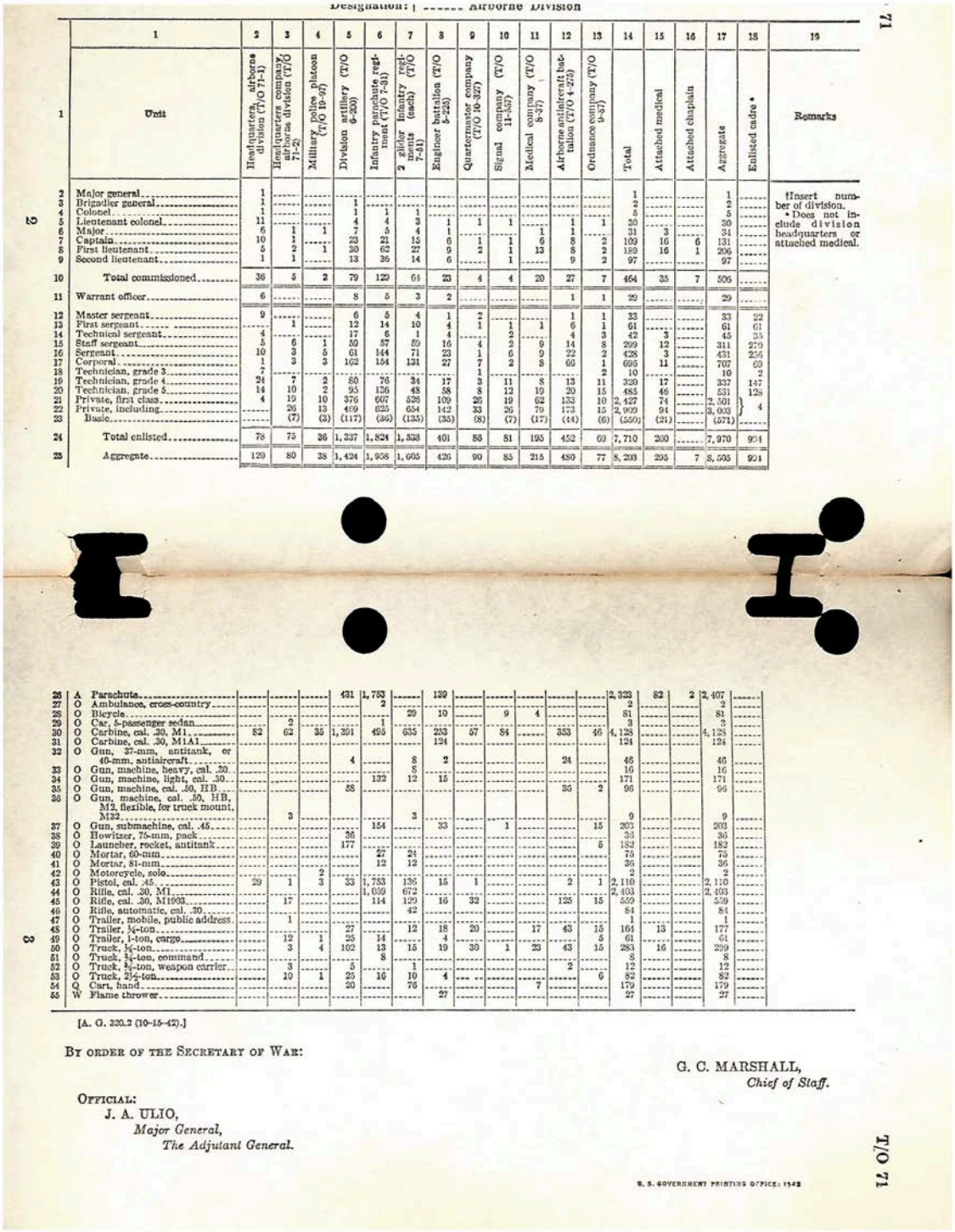



Figure 5. 101st Airborne Division Drop Pattern as of June 6, 1944. *United States Army, Utah Beach to Cherbourg: 6 June – 27 June 1944* (Washington, DC: Center of Military History), xiii, accessed 16 December 2016, http://www.history.army.mil/books/wwii/utah/maps/MAP36.JPG.

# Appendix 3



Designation: [ ] Airborne Division

| 1 | Unit | 2 Headquarters, Airborne division (T/O 71-1) | 3 Headquarters company, airborne division (T/O 71-2) | 4 Military police platoon (T/O 19-97) | 5 Division artillery (T/O 6-200) | 6 Infantry parachute regiment (T/O 7-31) | 7 2 glider infantry regiments (each) (T/O 7-51) | 8 Engineer battalion (T/O 5-225) | 9 Quartermaster company (T/O 10-327) | 10 Signal company (T/O 11-557) | 11 Medical company (T/O 8-37) | 12 Airborne antiaircraft battalion (T/O 4-275) | 13 Ordnance company (T/O 9-37) | 14 Total | 15 Attached medical | 16 Attached chaplain | 17 Aggregate | 18 Enlisted cadre * | 19 Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Major general | 1 | | | 1 | | | | | | | | | 1 | | | 1 | | †Insert number of division. *Does not include division headquarters or attached medical. |
| 3 | Brigadier general | 1 | | | 1 | | | | | | | | | 1 | | | 1 | | |
| 4 | Colonel | 1 | | | 1 | 1 | 1 | | | | | | | 5 | | | 5 | | |
| 5 | Lieutenant colonel | 11 | | | 4 | 4 | 3 | 1 | 1 | 1 | | 1 | 1 | 30 | | | 30 | | |
| 6 | Major | 6 | 1 | 1 | 7 | 5 | 4 | 1 | | | 1 | 1 | | 31 | 3 | | 34 | | |
| 7 | Captain | 10 | 1 | | 23 | 21 | 15 | 6 | 1 | 1 | 6 | 8 | 2 | 109 | 16 | 6 | 131 | | |
| 8 | First lieutenant | 5 | 2 | 1 | 30 | 62 | 27 | 9 | 2 | 1 | 13 | 8 | 2 | 189 | 16 | 1 | 206 | | |
| 9 | Second lieutenant | 1 | 1 | | 13 | 36 | 14 | 6 | | 1 | | 9 | 2 | 97 | | | 97 | | |
| 10 | Total commissioned | 36 | 5 | 2 | 79 | 129 | 64 | 23 | 4 | 4 | 20 | 27 | 7 | 464 | 35 | 7 | 506 | | |
| 11 | Warrant officer | 6 | | | 8 | 5 | 3 | 2 | | | | 1 | 1 | 29 | | | 29 | | |
| 12 | Master sergeant | 9 | | | 6 | 5 | 4 | 1 | 2 | | | 1 | 1 | 33 | | | 33 | 22 | |
| 13 | First sergeant | | 1 | | 12 | 14 | 10 | 4 | 1 | 1 | 1 | 6 | 1 | 61 | | | 61 | 61 | |
| 14 | Technical sergeant | 4 | | | 17 | 6 | 1 | 4 | | 2 | | 4 | 3 | 42 | 3 | | 45 | 35 | |
| 15 | Staff sergeant | 5 | 6 | 1 | 59 | 57 | 59 | 16 | 4 | 2 | 9 | 14 | 8 | 289 | 12 | | 311 | 270 | |
| 16 | Sergeant | 10 | 3 | 5 | 61 | 144 | 71 | 23 | 1 | 6 | 9 | 22 | 2 | 428 | 3 | | 431 | 256 | |
| 17 | Corporal | 1 | 3 | 3 | 162 | 154 | 131 | 27 | 7 | 2 | 8 | 66 | 1 | 695 | 11 | | 707 | 69 | |
| 18 | Technician, grade 3 | 7 | | | | | | | 1 | | | | 2 | 10 | | | 10 | 2 | |
| 19 | Technician, grade 4 | 24 | 7 | 2 | 80 | 76 | 34 | 17 | 3 | 11 | 8 | 13 | 11 | 320 | 17 | | 337 | 147 | |
| 20 | Technician, grade 5 | 14 | 10 | 2 | 95 | 126 | 48 | 38 | 8 | 12 | 19 | 20 | 15 | 485 | 46 | | 531 | 128 | |
| 21 | Private, first class | 4 | 19 | 10 | 376 | 607 | 528 | 109 | 26 | 19 | 62 | 133 | 10 | 2,427 | 74 | | 2,501 | 4 | |
| 22 | Private, including | | 26 | 13 | 499 | 625 | 654 | 142 | 33 | 26 | 79 | 173 | 15 | 2,909 | 94 | | 3,003 | | |
| 23 | Basic | | (7) | (3) | (117) | (36) | (135) | (35) | (8) | (7) | (17) | (44) | (6) | (550) | (21) | | (571) | | |
| 24 | Total enlisted | 78 | 75 | 36 | 1,337 | 1,824 | 1,538 | 401 | 86 | 81 | 195 | 452 | 69 | 7,710 | 260 | | 7,970 | 904 | |
| 25 | Aggregate | 120 | 80 | 38 | 1,424 | 1,958 | 1,605 | 426 | 90 | 85 | 215 | 480 | 77 | 8,203 | 295 | 7 | 8,505 | 904 | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | A | Parachute | | | | 431 | 1,753 | | 139 | | | | | 2,323 | 82 | 2 | 2,407 | | |
| 27 | O | Ambulance, cross-country | | | | | 2 | | | | | | | 2 | | | 2 | | |
| 28 | O | Bicycle | | | | | | 29 | 10 | | 9 | 4 | | 81 | | | 81 | | |
| 29 | O | Car, 5-passenger sedan | | 2 | | | 1 | | | | | | | 3 | | | 3 | | |
| 30 | O | Carbine, cal. .30, M1 | 62 | 62 | 35 | 1,301 | 496 | 635 | 253 | 57 | 84 | | 353 | 46 | 4,128 | | | 4,128 | |
| 31 | O | Carbine, cal. .30, M1A1 | | | | | | | 124 | | | | | | 124 | | | 124 | |
| 32 | O | Gun, 37-mm, antitank, or 40-mm, antiaircraft | | | | 4 | | 8 | 2 | | | | 24 | | 46 | | | 46 | |
| 33 | O | Gun, machine, heavy, cal. .30 | | | | | | 8 | | | | | | | 16 | | | 16 | |
| 34 | O | Gun, machine, light, cal. .30 | | | | | 132 | 12 | 15 | | | | | | 171 | | | 171 | |
| 35 | O | Gun, machine, cal. .50, HB | | | | 58 | | | | | | | 35 | 2 | 96 | | | 96 | |
| 36 | O | Gun, machine, cal. .50, HB, M2, flexible, for truck mount, M32 | | 3 | | | | 3 | | | | | | | 9 | | | 9 | |
| 37 | O | Gun, submachine, cal. .45 | | | | | 154 | | 33 | | 1 | | | 15 | 203 | | | 203 | |
| 38 | O | Howitzer, 75-mm, pack | | | | 36 | | | | | | | | | 36 | | | 36 | |
| 39 | O | Launcher, rocket, antitank | | | | 177 | | | | | | | | 5 | 182 | | | 182 | |
| 40 | O | Mortar, 60-mm | | | | | 27 | 24 | | | | | | | 75 | | | 75 | |
| 41 | O | Mortar, 81-mm | | | | | 12 | 12 | | | | | | | 36 | | | 36 | |
| 42 | O | Motorcycle, solo | | | 2 | | | | | | | | | | 2 | | | 2 | |
| 43 | O | Pistol, cal. .45 | 29 | 1 | 3 | 33 | 1,753 | 136 | 15 | 1 | | | 2 | 1 | 2,110 | | | 2,110 | |
| 44 | O | Rifle, cal. .30, M1 | | | | | 1,039 | 672 | | | | | | | 2,403 | | | 2,403 | |
| 45 | O | Rifle, cal. .30, M1903 | | 17 | | | 114 | 129 | 16 | 32 | | | 125 | 15 | 559 | | | 559 | |
| 46 | O | Rifle, automatic, cal. .30 | | | | | | 42 | | | | | | | 84 | | | 84 | |
| 47 | O | Trailer, mobile, public address | | 1 | | | | | | | | | | | 1 | | | 1 | |
| 48 | O | Trailer, ¼-ton | | | | 27 | | 12 | 18 | 20 | | 17 | 43 | 15 | 161 | 13 | | 177 | |
| 49 | O | Trailer, 1-ton, cargo | | 12 | 1 | 25 | 14 | | 4 | | | | | 5 | 61 | | | 61 | |
| 50 | O | Truck, ¼-ton | | 3 | 4 | 102 | 13 | 15 | 19 | 30 | 1 | 23 | 43 | 15 | 263 | 16 | | 299 | |
| 51 | O | Truck, ¾-ton, command | | | | | 8 | | | | | | | | 8 | | | 8 | |
| 52 | O | Truck, ¼-ton, weapon carrier | | 3 | | 5 | | 1 | | | | | 2 | | 12 | | | 12 | |
| 53 | O | Truck, 2½-ton | | 10 | 1 | 25 | 10 | 10 | 4 | | | | | 6 | 82 | | | 82 | |
| 54 | Q | Cart, hand | | | | 20 | | 76 | | | | 7 | | | 179 | | | 179 | |
| 55 | W | Flame thrower | | | | | | | 27 | | | | | | 27 | | | 27 | |

[A. G. 320.2 (10-15-42).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
*Chief of Staff.*

OFFICIAL:
J. A. ULIO,
*Major General,*
*The Adjutant General.*

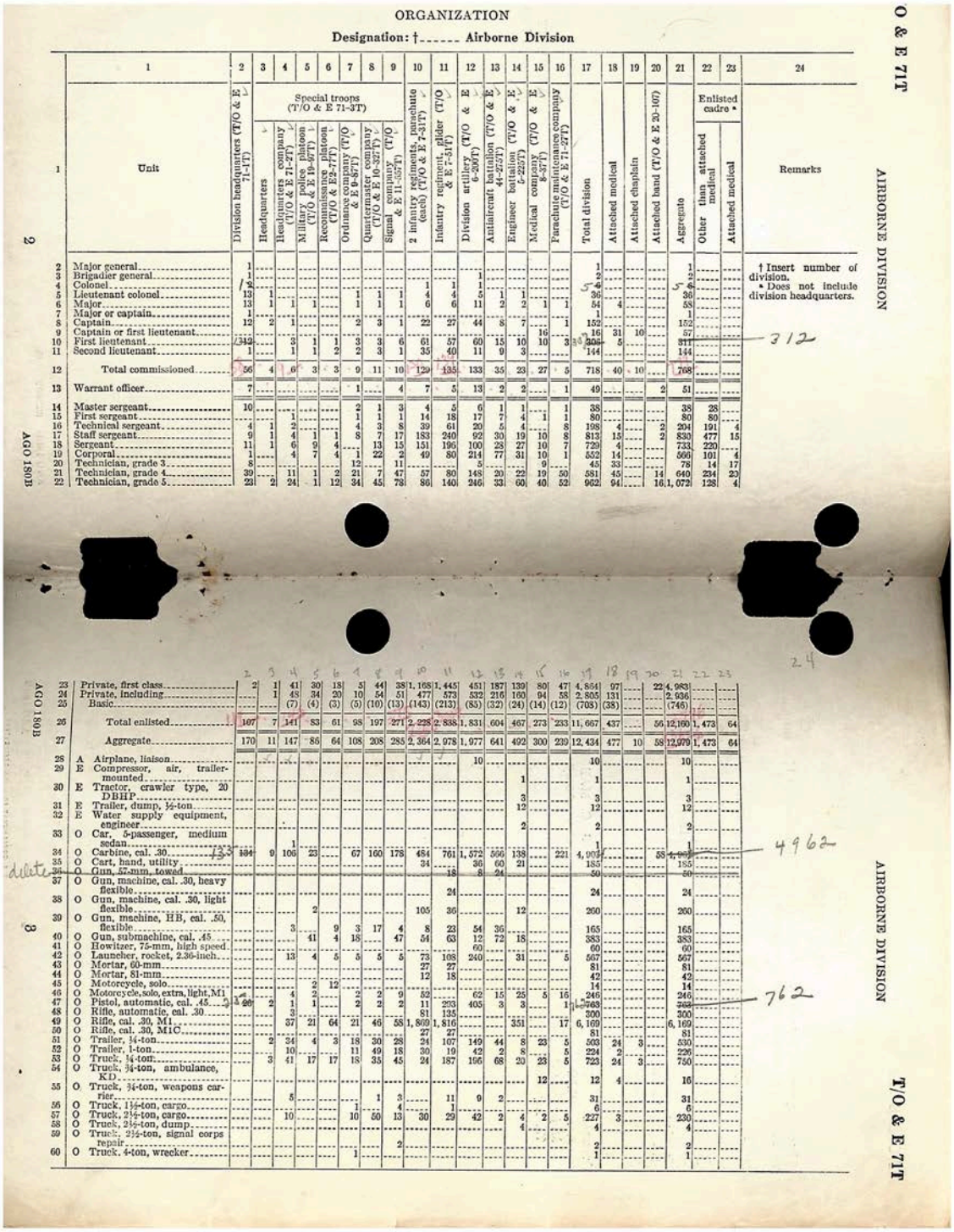
U. S. GOVERNMENT PRINTING OFFICE: 1942

71

TO 71

Figure 6. Airborne Division Table of Organization: October 15, 1942. US War Department, *Table of Organization No. 71, Airborne Division* (Washington, DC: Government Printing Office, 15 October 1942), 2-3.

# Appendix 4



ORGANIZATION

Designation: †_____ Airborne Division

T/O & E 71T — AIRBORNE DIVISION

| 1 | Unit | 2 Division headquarters (T/O & E 71-1T) | 3 Special troops (T/O & E 71-3T): Headquarters | 4 Headquarters company (T/O & E 71-2T) | 5 Military police platoon (T/O & E 19-27T) | 6 Reconnaissance platoon (T/O & E 2-77T) | 7 Ordnance company (T/O & E 9-87T) | 8 Quartermaster company (T/O & E 10-327T) | 9 Signal company (T/O & E 11-587T) | 10 2 infantry regiments, parachute (each) (T/O & E 7-31T) | 11 Infantry regiment, glider (T/O & E 7-51T) | 12 Division artillery (T/O & E 6-206T) | 13 Antiaircraft battalion (T/O & E 44-257T) | 14 Engineer battalion (T/O & E 5-225T) | 15 Medical company (T/O & E 8-37T) | 16 Parachute maintenance company (T/O & E 71-27T) | 17 Total division | 18 Attached medical | 19 Attached chaplain | 20 Attached band (T/O & E 20-107) | 21 Aggregate | 22 Enlisted cadre *: Other than attached medical | 22 Enlisted cadre *: Attached medical | 23 Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Major general | 1 | | | | | | | | | | | | | | | 1 | | | | 1 | | | † Insert number of division. |
| 3 | Brigadier general | 1 | | | | | | | | | | 1 | | | | | 2 | | | | 2 | | | * Does not include division headquarters. |
| 4 | Colonel | 2 | | | | | | | | 1 | 1 | 1 | | | | | 5 | | | | 5 | | | |
| 5 | Lieutenant colonel | 13 | 1 | | | | 1 | 1 | 1 | 4 | 4 | 5 | | 1 | | | 36 | | | | 38 | | | |
| 6 | Major | 13 | 1 | 1 | 1 | | 1 | 1 | 1 | 6 | 6 | 11 | 2 | 2 | 1 | 1 | 54 | 4 | | | 58 | | | |
| 7 | Major or captain | 1 | | | | | | | | | | | | | | | 1 | | | | 1 | | | |
| 8 | Captain | 12 | 2 | 1 | | | 2 | 3 | 1 | 22 | 27 | 44 | 8 | 7 | | 1 | 152 | | | | 152 | | | |
| 9 | Captain or first lieutenant | | | | | | | | | | | | | | 16 | | 16 | 31 | 10 | | 57 | | | |
| 10 | First lieutenant | 312 | | 3 | 1 | 1 | 3 | 3 | 6 | 61 | 57 | 60 | 15 | 10 | 10 | 3 | 305 | 5 | | | 311 | | | 312 |
| 11 | Second lieutenant | 1 | | 1 | 1 | 2 | 2 | 3 | 1 | 35 | 40 | 11 | 9 | 3 | | | 144 | | | | 144 | | | |
| 12 | Total commissioned | 56 | 4 | 6 | 3 | 3 | 9 | 11 | 10 | 129 | 135 | 133 | 35 | 23 | 27 | 5 | 718 | 40 | 10 | | 768 | | | |
| 13 | Warrant officer | 7 | | | | | 1 | | 4 | 7 | 5 | 13 | 2 | 2 | | 1 | 49 | | | 2 | 51 | | | |
| 14 | Master sergeant | 10 | | | | | 2 | 1 | 3 | 4 | 5 | 6 | 1 | 1 | | 1 | 35 | | | | 38 | 28 | | |
| 15 | First sergeant | | | 1 | | | 1 | 1 | 1 | 14 | 18 | 17 | 7 | 4 | 1 | 1 | 80 | | | | 80 | 80 | | |
| 16 | Technical sergeant | 4 | 1 | 2 | | | 4 | 3 | 8 | 39 | 61 | 20 | 5 | 4 | | 8 | 198 | 4 | | 2 | 204 | 191 | 4 | |
| 17 | Staff sergeant | 9 | 1 | 4 | 1 | 1 | 8 | 7 | 17 | 183 | 240 | 92 | 30 | 19 | 10 | 8 | 812 | 15 | | 2 | 833 | 477 | 15 | |
| 18 | Sergeant | 11 | 1 | 6 | 9 | 4 | | 13 | 15 | 151 | 196 | 100 | 28 | 27 | 10 | 7 | 729 | 4 | | | 733 | 220 | | |
| 19 | Corporal | 1 | | 4 | 7 | 4 | 1 | 22 | 2 | 49 | 80 | 214 | 77 | 31 | 10 | 1 | 552 | 14 | | | 566 | 101 | 4 | |
| 20 | Technician, grade 3 | 8 | | | | | 12 | | 11 | | | 5 | | | 9 | | 45 | 33 | | | 78 | 14 | 17 | |
| 21 | Technician, grade 4 | 39 | | 11 | 1 | 2 | 21 | 7 | 47 | 57 | 80 | 148 | 20 | 22 | 19 | 50 | 581 | 45 | | 14 | 640 | 234 | 23 | |
| 22 | Technician, grade 5 | 23 | 2 | 24 | 1 | 12 | 34 | 45 | 78 | 86 | 140 | 246 | 33 | 60 | 40 | 52 | 962 | 94 | | 16 | 1,072 | 138 | 4 | |
| 23 | Private, first class | 2 | 1 | 41 | 30 | 13 | 5 | 44 | 38 | 1,168 | 1,445 | 451 | 187 | 139 | 80 | 47 | 4,864 | 97 | | 22 | 4,983 | | | |
| 24 | Private, including | | 1 | 48 | 34 | 20 | 10 | 54 | 51 | 477 | 573 | 532 | 216 | 160 | 94 | 58 | 2,805 | 131 | | | 2,936 | | | |
| 25 | Basic | | | (7) | (4) | (3) | (5) | (10) | (13) | (143) | (213) | (85) | (32) | (24) | (14) | (12) | (708) | (38) | | | (746) | | | |
| 26 | Total enlisted | 107 | 7 | 141 | 83 | 61 | 98 | 197 | 271 | 2,228 | 2,838 | 1,831 | 604 | 467 | 273 | 233 | 11,667 | 437 | | 56 | 12,160 | 1,473 | 64 | |
| 27 | Aggregate | 170 | 11 | 147 | 85 | 64 | 108 | 208 | 285 | 2,364 | 2,978 | 1,977 | 641 | 492 | 300 | 239 | 12,434 | 477 | 10 | 58 | 12,979 | 1,473 | 64 | |
| 28 | A Airplane, liaison | | | | | | | | | | | 10 | | | | | 10 | | | | 10 | | | |
| 29 | E Compressor, air, trailer-mounted | | | | | | | | | | | | | 1 | | | 1 | | | | 1 | | | |
| 30 | E Tractor, crawler type, 20 DBHP | | | | | | | | | | | | | 3 | | | 3 | | | | 3 | | | |
| 31 | E Trailer, dump, ½-ton | | | | | | | | | | | | | 12 | | | 12 | | | | 12 | | | |
| 32 | E Water supply equipment, engineer | | | | | | | | | | | | | 2 | | | 2 | | | | 2 | | | |
| 33 | O Car, 5-passenger, medium sedan | | | 1 | | | | | | | | | | | | | 1 | | | | 1 | | | |
| 34 | O Carbine, cal. .30 | 4962 | 9 | 106 | 23 | | 67 | 160 | 178 | 484 | 761 | 1,572 | 566 | 138 | | 221 | 4,909 | | | 55 | 4,964 | | | |
| 35 | O Cart, hand, utility | | | | | | | | | 34 | | 36 | 60 | 21 | | | 185 | | | | 185 | | | |
| 36 | O Gun, 57-mm, towed | | | | | | | | | | | 18 | 8 | 24 | | | 50 | | | | 50 | | | |
| 37 | O Gun, machine, cal. .30, heavy flexible | | | | | | | | | | 24 | | | | | | 24 | | | | 24 | | | |
| 38 | O Gun, machine, cal. .30, light flexible | | | | 2 | | | | | 105 | 36 | | | 12 | | | 200 | | | | 200 | | | |
| 39 | O Gun, machine, HB, cal. .50, flexible | | | 3 | | 9 | 3 | 17 | 4 | 8 | 23 | 54 | 36 | | | | 165 | | | | 165 | | | |
| 40 | O Gun, submachine, cal. .45 | | | | 41 | 4 | 18 | | 47 | 54 | 63 | 12 | 72 | 15 | | | 383 | | | | 383 | | | |
| 41 | O Howitzer, 75-mm, high speed | | | | | | | | | | | 60 | | | | | 60 | | | | 60 | | | |
| 42 | O Launcher, rocket, 2.36-inch | | | 13 | 4 | 5 | 5 | 5 | 5 | 73 | 108 | 240 | | 31 | | 5 | 567 | | | | 567 | | | |
| 43 | O Mortar, 60-mm | | | | | | | | | 27 | 27 | | | | | | 81 | | | | 81 | | | |
| 44 | O Mortar, 81-mm | | | | | | | | | 12 | 18 | | | | | | 42 | | | | 42 | | | |
| 45 | O Motorcycle, solo | | | | 2 | 12 | | | | | | | | | | | 14 | | | | 14 | | | |
| 46 | O Motorcycle, solo, extra, light, M1 | | | 4 | 2 | | 2 | 2 | 9 | 52 | | 62 | 15 | 25 | 5 | 16 | 246 | | | | 246 | | | |
| 47 | O Pistol, automatic, cal. .45 | 762 | 2 | 1 | 1 | | 2 | 2 | 2 | 11 | 233 | 405 | 3 | 3 | | 1 | 768 | | | | 768 | | | 762 |
| 48 | O Rifle, automatic, cal. .30 | | | 3 | | | | | | 81 | 135 | | | | | | 300 | | | | 300 | | | |
| 49 | O Rifle, cal. .30, M1 | | | 37 | 21 | 64 | 21 | 46 | 58 | 1,809 | 1,816 | | | 351 | | 17 | 6,169 | | | | 6,169 | | | |
| 50 | O Rifle, cal. .30, M1C | | | | | | | | | 27 | 27 | | | | | | 81 | | | | 81 | | | |
| 51 | O Trailer, ¼-ton | | 2 | 34 | 4 | 3 | 18 | 30 | 28 | 24 | 107 | 149 | 44 | 8 | 23 | 5 | 503 | 24 | 3 | | 530 | | | |
| 52 | O Trailer, 1-ton | | | 10 | | | 11 | 49 | 18 | 30 | 19 | 42 | 2 | 8 | | 5 | 224 | 2 | | | 226 | | | |
| 53 | O Truck, ¼-ton | | 3 | 41 | 17 | 17 | 18 | 35 | 45 | 24 | 187 | 196 | 68 | 20 | 23 | 5 | 723 | 24 | 3 | | 750 | | | |
| 54 | O Truck, ¾-ton, ambulance, KD | | | | | | | | | | | | | | 12 | | 12 | 4 | | | 16 | | | |
| 55 | O Truck, ¾-ton, weapons carrier | | | 5 | | | | 1 | 3 | | 11 | 9 | 2 | | | | 31 | | | | 31 | | | |
| 56 | O Truck, 1½-ton, cargo | | | | | | 1 | | 4 | | 1 | | | | | | 6 | | | | 6 | | | |
| 57 | O Truck, 2½-ton, cargo | | | 10 | | | 10 | 50 | 13 | 30 | 29 | 42 | 2 | 4 | 2 | 5 | 227 | 3 | | | 230 | | | |
| 58 | O Truck, 2½-ton, dump | | | | | | | | | | | | | 4 | | | 4 | | | | 4 | | | |
| 59 | O Truck, 2½-ton, signal corps repair | | | | | | | | 2 | | | | | | | | 2 | | | | 2 | | | |
| 60 | O Truck, 4-ton, wrecker | | | | | | 1 | | | | | | | | | | 1 | | | | 1 | | | |

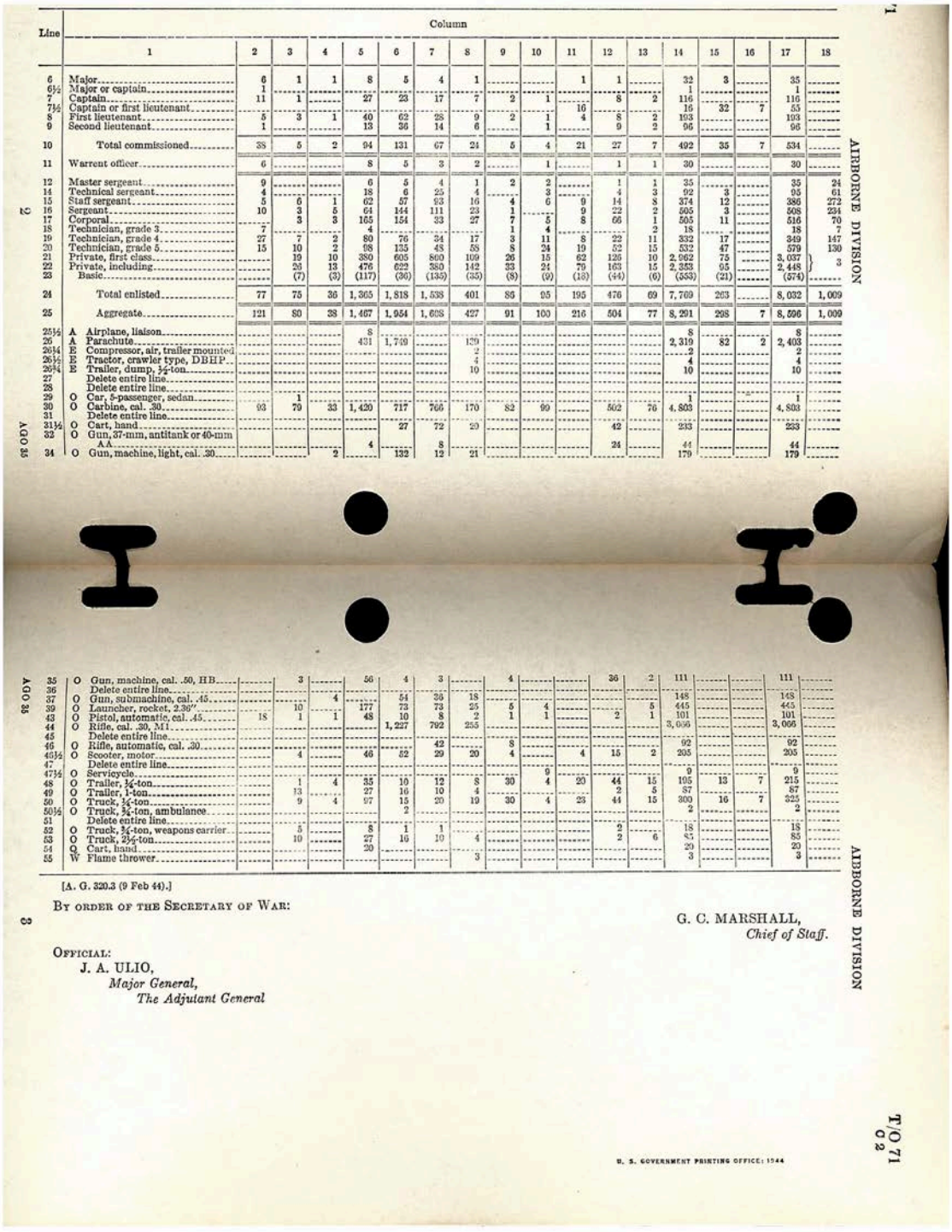
AGO 180B — 2

AGO 180B — 3

T/O & E 71T — AIRBORNE DIVISION

Figure 7. Airborne Division Table of Organization: December 16, 1944, US War Department, Table of Organization No. 71T, Airborne Division (Washington, DC: Government Printing Office, December 16, 1944), 2-3.

# Appendix 5



| Line | | | Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | | | Major | 6 | 1 | 1 | 8 | 5 | 4 | 1 | | | 1 | 1 | | 32 | 3 | | 35 | |
| 6½ | | | Major or captain | 1 | | | | | | | | | | | | 1 | | | 1 | |
| 7 | | | Captain | 11 | 1 | | 27 | 23 | 17 | 7 | 2 | 1 | | 8 | 2 | 116 | | | 116 | |
| 7½ | | | Captain or first lieutenant | | | | | | | | | | 16 | | | 16 | 32 | 7 | 55 | |
| 8 | | | First lieutenant | 5 | 3 | 1 | 40 | 62 | 28 | 9 | 2 | 1 | 4 | 8 | 2 | 193 | | | 193 | |
| 9 | | | Second lieutenant | 1 | | | 13 | 36 | 14 | 6 | | 1 | | 9 | 2 | 96 | | | 96 | |
| 10 | | | Total commissioned | 38 | 5 | 2 | 94 | 131 | 67 | 24 | 5 | 4 | 21 | 27 | 7 | 492 | 35 | 7 | 534 | |
| 11 | | | Warrant officer | 6 | | | 8 | 5 | 3 | 2 | | 1 | | 1 | 1 | 30 | | | 30 | |
| 12 | | | Master sergeant | 9 | | | 6 | 5 | 4 | 1 | 2 | 2 | | 1 | 1 | 35 | | | 35 | 24 |
| 14 | | | Technical sergeant | 4 | | | 18 | 6 | 25 | 4 | | 3 | | 4 | 3 | 92 | 3 | | 95 | 61 |
| 15 | | | Staff sergeant | 5 | 6 | 1 | 62 | 57 | 63 | 16 | 4 | 6 | 9 | 14 | 8 | 374 | 12 | | 386 | 272 |
| 16 | | | Sergeant | 10 | 3 | 5 | 64 | 144 | 111 | 23 | 1 | | 9 | 22 | 2 | 505 | 3 | | 508 | 234 |
| 17 | | | Corporal | | 3 | 3 | 165 | 154 | 33 | 27 | 7 | 5 | 8 | 66 | 1 | 505 | 11 | | 516 | 70 |
| 18 | | | Technician, grade 3 | 7 | | | 4 | | | | 1 | 4 | | | 2 | 18 | | | 18 | 7 |
| 19 | | | Technician, grade 4 | 27 | 7 | 2 | 80 | 76 | 34 | 17 | 3 | 11 | 8 | 22 | 11 | 332 | 17 | | 349 | 147 |
| 20 | | | Technician, grade 5 | 15 | 10 | 2 | 98 | 135 | 48 | 58 | 8 | 24 | 19 | 52 | 15 | 532 | 47 | | 579 | 130 |
| 21 | | | Private, first class | | 19 | 10 | 380 | 605 | 800 | 109 | 26 | 15 | 62 | 126 | 10 | 2,962 | 75 | | 3,037 | 3 |
| 22 | | | Private, including | | 26 | 13 | 476 | 622 | 380 | 142 | 33 | 24 | 79 | 163 | 15 | 2,353 | 95 | | 2,448 | |
| 23 | | | Basic | | (7) | (3) | (117) | (36) | (135) | (35) | (8) | (9) | (18) | (44) | (6) | (553) | (21) | | (574) | |
| 24 | | | Total enlisted | 77 | 75 | 36 | 1,365 | 1,818 | 1,538 | 401 | 86 | 95 | 195 | 476 | 69 | 7,769 | 263 | | 8,032 | 1,009 |
| 25 | | | Aggregate | 121 | 80 | 38 | 1,467 | 1,954 | 1,603 | 427 | 91 | 100 | 216 | 504 | 77 | 8,291 | 298 | 7 | 8,596 | 1,009 |
| 25½ | A | | Airplane, liaison | | | | 8 | | | | | | | | | 8 | | | 8 | |
| 26 | A | | Parachute | | | | 431 | 1,719 | | 129 | | | | | | 2,319 | 82 | 2 | 2,403 | |
| 26¼ | E | | Compressor, air, trailer mounted | | | | | | | 2 | | | | | | 2 | | | 2 | |
| 26½ | E | | Tractor, crawler type, DBHP | | | | | | | 4 | | | | | | 4 | | | 4 | |
| 26¾ | E | | Trailer, dump, ½-ton | | | | | | | 10 | | | | | | 10 | | | 10 | |
| 27 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 28 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 29 | O | | Car, 5-passenger, sedan | | 1 | | | | | | | | | | | 1 | | | 1 | |
| 30 | O | | Carbine, cal. .30 | 93 | 79 | 33 | 1,420 | 717 | 766 | 170 | 82 | 99 | | 502 | 76 | 4,803 | | | 4,803 | |
| 31 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 31½ | O | | Cart, hand | | | | | 27 | 72 | 20 | | | | 42 | | 233 | | | 233 | |
| 32 | O | | Gun, 37-mm, antitank or 40-mm AA | | | | 4 | | 8 | | | | | 24 | | 44 | | | 44 | |
| 34 | O | | Gun, machine, light, cal. .30 | | | 2 | | 132 | 12 | 21 | | | | | | 179 | | | 179 | |
| 35 | O | | Gun, machine, cal. .50, HB | | 3 | | 56 | 4 | 3 | | 4 | | | 36 | 2 | 111 | | | 111 | |
| 36 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 37 | O | | Gun, submachine, cal. .45 | | | 4 | | 54 | 36 | 18 | | | | | | 148 | | | 148 | |
| 39 | O | | Launcher, rocket, 2.36" | | 10 | | 177 | 73 | 73 | 25 | 5 | 4 | | | 5 | 445 | | | 445 | |
| 43 | O | | Pistol, automatic, cal. .45 | 18 | 1 | 1 | 48 | 10 | 8 | 2 | 1 | 1 | | 2 | 1 | 101 | | | 101 | |
| 44 | O | | Rifle, cal. .30, M1 | | | | | 1,227 | 792 | 255 | | | | | | 3,066 | | | 3,066 | |
| 45 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 46 | O | | Rifle, automatic, cal. .30 | | | | | | 42 | | 8 | | | | | 92 | | | 92 | |
| 46½ | O | | Scooter, motor | | 4 | | 46 | 52 | 29 | 20 | 4 | | 4 | 15 | 2 | 205 | | | 205 | |
| 47 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 47½ | O | | Servicycle | | | | | | | | | 9 | | | | 9 | | | 9 | |
| 48 | O | | Trailer, ¼-ton | | 1 | 4 | 35 | 10 | 12 | 8 | 30 | 4 | 20 | 44 | 15 | 195 | 13 | 7 | 215 | |
| 49 | O | | Trailer, 1-ton | | 13 | | 27 | 16 | 10 | 4 | | | | 2 | 5 | 87 | | | 87 | |
| 50 | O | | Truck, ¼-ton | | 9 | 4 | 97 | 15 | 20 | 19 | 30 | 4 | 23 | 44 | 15 | 309 | 16 | 7 | 325 | |
| 50½ | O | | Truck, ¾-ton, ambulance | | | | | 2 | | | | | | | | 2 | | | 2 | |
| 51 | | | Delete entire line | | | | | | | | | | | | | | | | | |
| 52 | O | | Truck, ¾-ton, weapons carrier | | 5 | | 8 | 1 | 1 | | | | | 2 | | 18 | | | 18 | |
| 53 | O | | Truck, 2½-ton | | 10 | | 27 | 16 | 10 | 4 | | | | 2 | 6 | 85 | | | 85 | |
| 54 | Q | | Cart, hand | | | | 20 | | | | | | | | | 20 | | | 20 | |
| 55 | W | | Flame thrower | | | | | | | 3 | | | | | | 3 | | | 3 | |

[A. G. 320.3 (9 Feb 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
*Chief of Staff.*

OFFICIAL:
J. A. ULIO,
*Major General,*
*The Adjutant General*

U. S. GOVERNMENT PRINTING OFFICE: 1944

AIRBORNE DIVISION

T/O 71
C 2

Figure 8. Airborne Division Table of Organization: February 24, 1944. US War Department. Table of Organization No. 71, Airborne Division, Change 2 (Washington, DC: Government Printing Office, February 24, 1944), 2-3.

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